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Volume of Market Is Growing

New Business Below Shipments, However, and Deliveries Are Easier—Railroads Place 250,000 Tons of Rails—Other Large Orders Closed—Some Capacity Beginning To Show Effects of Hard Driving—Some Prices Yield

NEW business in steel is in larger volume and more diversified though it still falls considerably short of meeting the heavy flow of shipments from the mills against orders previously entered. As a result, deliveries in some lines are easier. Examination of past periods of prosperity for the industry show that some slowing up of general activity usually has developed at this season of the year. This fact plus the better tone that undeniably characterizes the market, has created the belief among some of the leading producers that the recent letdown of confidence has passed its lowest point and that gradually expanding buying on a rational basis is to be expected. All tests show underlying consumption is continuing at an unprecedented rate. Some blast furnaces and other works capacity here and there are beginning to show the effects of recent hard driving and more suspensions for relining and repairs are in sight.

Railroad demand still stands before the market as one of its strongest supports, both in actual and prospective tonnage. The past week has seen this fact brought forth conspicuously. The New York Central railroad order for 150,000 tons for last half has been definitely placed with an option for 25,000 tons additional. The Pennsylvania has closed for 15,000 tons, the Southern Pacific for 13,000 tons more and western roads have placed 60,000 tons. At Chicago, 20,000 tons of track fastenings are under inquiry. The Pennsylvania has placed 20,000 tons of plates, shapes and bars for third quarter shop needs and the Reading 1500 tons. The Pere Marquette wants 5000 tons for two car ferries.

High Output in Steel

With two more working days than April, May established the highest total of steel ingot production in history, or approximately 4,200,000 tons. The average daily rate, however, was slightly less than in April which represents the first break in the consecutive monthly gains since last November. In May the works produced steel at the annual rate of 48,440,000 tons compared with the annual rate of 49,110,000 tons in April.

The fall in IRON TRADE REVIEW composite of fourteen leading iron and steel products has gone further this week to $46.30. This compares with $46.79 one week ago, $47.26 two weeks ago and with an average of $47.52 for May.

More Faith Is Shown

Stronger faith in future conditions is suggested by the more numerous undertakings of large size that now are coming up. The Hetch Hetchy aqueduct near San Francisco requiring 24,700 tons has finally been placed with New York and Pacific Coast contractors. Placing of oil storage capacity has been resumed after a lapse of some weeks. About 20,000 tons of new tank work has been placed including 13,000 tons for one Pacific Coast oil interest. The government is inquiring for sixteen river barges requiring 18,000 tons. One buyer is seeking 22,000 tons of oil line pipe.

The pig iron market still shows a slight downward inclination though prices seem better stabilized after their recent decline. Further easiness has developed in southern Ohio and Buffalo. Valley foundry iron is 50 cents lower. Despite contrary reports, the southern market remains at $27 Birmingham. Buyers are more interested in third quarter needs but are placing tonnage very carefully. Some second quarter tonnage has been deferred into third quarter at the request of foundries, with labor shortages given as the cause.

Some Prices Soften

Variations in the black sheet market again are noted this week especially in the East where specified delivery in the next two or three months is offered at 3.75c Pittsburgh or $2 under the quotation of the leading producer. As low as 3.70c has recently appeared. Reported concessions in blue annealed seem less acceptable, however, as one large interest has refused 50,000 tons at the regular price because of inability to deliver as desired. With one maker now naming $42.50, sheet bars for third quarter show a settling tendency. Other producers who have sold sheet bars higher for third quarter may meet this price. Nuts and bolts for third quarter are offered at 10 points additional discount. Otherwise steel prices are firm except so far as premiums gradually are being wiped out.

Business Trend and Chart Section Page 1741

Revival of Iron Market Slow

Inquiries and Sales Are Heavier but Buyers Still Move Carefully—Some Second Quarter Shipments Are Deferred by Users, Attributing Labor Shortage—Prices Appear Better Stabilized After Recent Decline

PITTSBURGH, June 12.—Interest in pig iron still lags particularly with reference to forward buying. In price the steelmaking grades are unchanged while foundry irons have declined another 50 cents per ton. Since the purchase of basic iron recorded one week ago for a Butler, Pa., consumer, 2500 tons at $27.50, valley, another purchase of similar size has been closed at the same price by another producer. Ressemer iron still is held at $29, valley but due to lack of inquiry or buying that price is nominal and open to negotiation. Small sales of foundry iron continue to be recorded involving from 50 to 100 tons each with an occasional tonnage of slightly larger proportions. The majority of these is going at $28.50, valley although some interests lately have gone to $28, valley basis for the No. 2 grade 1.75 to 2.25 silicon, making a spread which is 50 cents under that prevailing one week ago. Makers are obtaining 50 cents for each additional 50 points of silicon over the No. 2 grade. As indicated, buying for future still is held up and no contracts for third quarter iron are being written on the books to join the few that were closed up several weeks ago when the market was quoted at around $31, valley. Consumers apparently are of one mind in postponing action on third quarter tonnages and some producers are thinking favorably of proposing that they buy from month to month on trade paper quotations. Gray forge is quoted the same as No. 3 or 50 cents under the No. 2 grade price. No inquiries are current for gray forge or malleable, the latter being quoted at $28.50 to $29, valley. Some low phosphorus copper-free iron, about 200 tons, was sold here this past week by an eastern Pennsylvania producer at $35.34, delivered Pittsburgh but the valley producer still is quoting $36, valley. The Sharpsville Furnace Co. stack at Sharpsville, Pa., now is in blast after being idle for two years but the Kittanning Iron & Steel Mfg. Co. stack at Kittanning, Pa. was blown out this morning. It is reported here that at least two steelworks blast furnaces in the Mahoning valley will be blown out in the near future for relining or repairs. The Carnegie Steel Co. has 53 out of 59 stacks active so that at the moment, pig iron production is practically unchanged.

Pennsylvania Prices Fall

Boston, June 12.—New low pig iron prices in the Pennsylvania district have developed during the past week, but in most cases these have failed to increase buying. One eastern Pennsylvania furnace with a base price of $29 and with 50-cent differentials has thoroughly canvassed the New England trade during the last few days, but has failed to obtain more than 500 or 600 tons in small orders. A Massachusetts consumer received bids on 200 tons of No. 2X iron and is understood to have placed it at $33, delivered. One dealer who quoted $33.16 was told his bid was too high. It is rumored that a furnace with a $3.65 freight rate is quoting $28.50 for the base grade. The appearance of round tonnages in New England would bring out prices $1 below those of a week ago. In order to meet the $29, eastern Pennsylvania, prices for delivery in New England Buffalo furnaces have to quote $27.73, which none of them apparently is willing to do. However, on the higher silicon grades Buffalo furnaces seem more inclined to shade differentials, and on an inquiry for No. 1X iron (2.75 to 3.25 silicon,) a Buffalo furnace was the low bidder. Several Buffalo furnaces are now on a $29 base with the same price quoted for No. 2X iron (2.25 to 2.75 silicon.)

Extended Statistics of American Iron and Steel Production and Ingot and Casting Output, page 1780

New York Inquiry Better

New York, June 12.—While actual sales of pig iron in this district have been small in the aggregate, probably not exceeding 3000 tons, new inquiry is improving. Altogether, current inquiries call for at least 6000 tons, mostly for the third quarter, and the largest single lot included in this total is one of several thousand tons. In addition, there is one lot of 1000 tons, and several smaller inquiries. The Ingersoll-Rand Co. is in the market for 500 tons of 2.25 to 2.75 silicon for prompt shipment. The Eastern Malleable Iron Co. is understood to have closed on an inquiry for 500 to 1000 tons of malleable for its Wilmington, Del. plant. It is understood that the New York Central railroad has closed its inquiry for the requirements of its Elkhart, Ind., and Frankfort, N. Y. shops, most of the iron coming from Buffalo furnaces. The market continues unchanged at the reduced level announced last week and reflects a tendency to be firm at this level. Eastern Pennsylvania and New Jersey furnaces as far as known, are not quoting less than $29 base furnace for foundry iron, plus $1 silicon differentials. Central Pennsylvania foundry may be had at $27.50 to $28 base furnace, plus 50-cent silicon differentials. Buffalo iron at present is not much of a factor in the competition here owing to the extent to which the Buffalo production is sold ahead.

Buffalo Makers Accept $29

Buffalo, June 12.—Most of the local pig iron makers have accepted the $29 base as the market and are offering material for sale at that price. The range is $29.50 for No. 2X (2.25 to 2.75 silicon) and $30 for No. 1X (2.75 to 3.25 silicon). Some iron of 1.75 to 2.25 silicon is being sold at $29.50, and the seller says he is dipping only in cases where there is competition for tonnage. Total inquiry is for about 2500 tons and sales are smaller than this. One furnace interest states it has 60 per cent of its product sold for the third quarter and is not anxious to make lower prices. The last basic sale was made at $30 but in view of the weakening of the market, the quotable price for this is $29.

Inquiries Are Encouraging

Cleveland, June 12.—More buyers of pig iron are sounding out the market for the third quarter, and this is encouraging to sellers, but sales during the week were somewhat smaller than in the period preceding and in this respect the market continues dull. The market is entirely in the buyers' hands so far as iron from southern Ohio, the valley and Buffalo is concerned, and in southern Ohio, where heavy stocks are on hand, the price has softened. A part of the inquiry for 1500 tons of malleable, issued two weeks ago by a Columbus, O., user was closed a few days ago at $28, Ironton, and it is understood that more tonnage, of foundry and malleable, can be had at that figure. One of the interests represented in the northern Ohio group this week sold a moderate lot of foundry iron on a basis of $29, valley, and that figure is considered the more general price in the valley and at Buffalo. The inquiry from a Port Huron, Mich., melter for 4000 tons of foundry iron has not been closed, and it is reported here that this has been withdrawn for the present. Small lots of foundry iron off-grade have been sold at $27, valley basis. Basic iron has been offered freely here at $28, valley, and pig iron makers regard that as more representative of the basic market today, despite the sale of 2500 tons at $27.50, reported a week ago. The inquiry for 5000 tons of basic current here last week has not been closed with any of the furnaces in the northern Ohio group. No new inquiries have been received for basic; new inquiries for foundry iron received by a large interest here in the week numbered about six, for lots from 500 tons to 1000 tons.

St. Louis Market Quiet

St. Louis, June 11.—The pig iron market continues to mark time, neither buyers nor sellers being inclined to press matters. The general feeling is that a buying movement is only a short distance ahead, but each side is waiting for the other to take the first step. Selling agencies believe that as soon as

buying begins elsewhere, especially in the East, the local melters will quickly fall into line. Many important buyers declare that the only thing keeping them from filling their third and fourth quarter needs is the present high price. They prefer taking iron as they need it rather than to make heavy commitments at a price which may be reduced before the iron is melted. Actual sales are at a minimum, and inquiry hardly totals 700 tons, including 150 tons of malleable. The only sales reported were 250 tons to a Kansas melter who originally inquired for 500 tons; 100 tons to a stovemaker in this district; 100 tons to an Iowa melter; 50 tons to an enginemaker and scattered car lots totaling about 230 tons. Some slight improvement since June 1 is reported in new business by the grey iron plants, and all the machine shops continue busy. Prices on pig iron remain steady, but some resale iron is appearing in the North and South, and the feeling is easier.

Sales Still in Small Lots

Birmingham, Ala., June 11.—The southern pig iron market shows a little betterment inasmuch as a number of small-lot sales are being booked, where third quarter delivery can be guaranteed. Inquiries also are picking up as to future delivery. The buying is far from being active but the numerous small lots aggregate a considerable tonnage. Two or three sales of 1000 tons each are reported having been closed recently while a number of sales have been for 250 to 600 tons. Some of the railroads have purchased small lots of iron lately. Reports continue that some consumers are not getting their metal as quickly as needed and furnace interests are being urged to make effort to deliver more rapidly. As a consequence much iron was moved out this week, almost as quickly as produced and a little went from the yards. Including the basic iron, and one company has over 10,000 tons of that product, the aggregate tonnage of furnace yards in this state is less than 33,000 tons. Foundry iron piled up is getting to the point of being neglible. Realignment of freight rates from northern iron and steel producing centers to Birmingham, Atlanta, Memphis, New Orleans, Memphis and other points will become effective July 1, if the interstate commerce commission approves. Advances in rates out of Birmingham, however, will offset the reduction made to this section. Further readjustments are also looked for on pig iron by water and rail from the Sheffield-Florence, district to Chicago and St. Louis territories.

Buying Increasing at Chicago

Chicago, June 12.—Though buying of third quarter pig iron is increasing steadily, it is not yet general or decided in movement. With less than three weeks remaining in the first half many melters still are waiting for the reduction they believe will precede general buying. The market is holding firmly at $32 for northern iron and $27 for southern. The northern silicon differential is 50 cents for the first step and $1 for succeeding steps. Furnace and foundry stocks are small, most melters having less than

(*Concluded on Page* 1720)

Furnace Coke Again Cut

Some Furnaces Closing at $5.25 to $5.50, Others Waiting for Still Lower Level—Foundry Quotations Unchanged; Little Interest

COKE PRICES, PAGE 1721

Pittsburgh, June 12.—Several additional contracts for beehive furnace coke have been closed at $5.25 to $5.75, ovens, registering another slight decline. The majority of these have been at $5.50, the list including some representative blast furnace operators such as the Shenango Furnace Co. and the Reading Iron Co. The former bought in the neighborhood of 10,000 tons monthly for the third quarter unfilled portion of its requirements for two furnaces, while the latter contracted for full requirements. One or two others have closed at $5.50. Makers of standard 48-hour fuel in the Connellsville regions quoted that figure on the original inquiries. One furnace has just closed on high grade coke for the third quarter at $5.75, but a Cleveland consumer last week closed on the full requirements for one furnace and the partial requirements of another at $5.25, ovens. One or two furnace operators including M. A. Hanna & Co. still are holding out for an even lower level than $5.25, but some like the Wheeling Steel Corp. probably will decide to purchase on a month to month basis. In the spot market prices all the way from $4.50 to $5 prevail, from one to five carloads at a time being available at $4.50 and $4.75 as distress circumstances arise. These supplies are being bought by various consuming interests. Medium sulphur coke is being sold at $3.50, ovens, upward. The foundry coke market is unchanged from a week ago being quotable at $5.50 to $6.50, although on some single carload inquiries for high grade brands $6.75 is quoted. One producing interest is understood to be starting negotiations with its customers on their third quarter requirements at $7.50. Not much interest, however, is shown in foundry coke contracts, buyers deferring action as much as possible hoping to develop lower figures. Production, according to the *Connellsville Courier*, for the week ended June 2 was 293,330 tons as compared with 295,675 tons the preceding week.

Southern Market Quiet

Birmingham, Ala., June 11.—A little coke business still is coming in, many foundries and other consumers buying small lots. By-product coke production is being kept up to the maximum, while no beehive ovens have been blown out lately.

Spot Sales Improve

Boston, June 12.—The rush of pig iron, sand and other materials to foundries as a result of the lifting of railroad embargoes has caused congestion at many plants so that coke shipments on contract are being held up. This, however, is partly offset by a slight increase in spot buying. Both of the New England by-product producers are offering spot foundry coke at $14, delivered, the same price as quoted on contract, and some manufacturers not covered on contract have taken advantage of this by placing orders for coke until the end of first half. Connellsville coke is offered at $12.50 to $13.50, delivered, and with shipments greatly improved some foundries are turning their attention to this fuel. The by-product fuel, continues to hold the bulk of the trade despite the price discrepancy.

Foundry Coke Prices

New York, June 12.—Some of the lower prices on foundry coke recently current have been withdrawn and it now is difficult to obtain standard foundry fuel for spot shipment at less than $5.75, Connellsville. Some $5.50 coke still is in the market but this price now is exceptional. On special brands as high as $6.25 is being obtained. A large beehive operator which recently reduced its second half contract price to $7.50, Connellsville, has booked considerable second half tonnage in the aggregate, but otherwise there is very little contracting. The Seaboard By-Products Coke Co. continues to quote $12.84 to $12.91, delivered at Newark, and other northern New Jersey points for by-product foundry coke.

More Contracting Done

St. Louis, June 11.—Contracting for coke requirements has improved since June 1. By-product manufacturers report orders booked to date are in excess of the corresponding period a year ago. Representatives of eastern ovens say that their customers are willing to purchase. Prices show an easier tendency, though no specific changes have been made in quotations of the local by-product ovens.

Cincinnati Market Quiet

Cincinnati, O., June 12.—Quiet prevails in the local coke market. Transactions the past few days were of small consequence. Selling agencies report prices on Connellsville coke, stiffening as the result of curtailment of production in that district. Sales in small lots for prompt shipment dominate. A Hamilton O. user closed for 200 tons of domestic coke for immediate delivery, the largest transaction of the week. An inquiry for 1000 tons of foundry coke for last half has been received from Louisville, Ky. A seller has been offered a contract for a car a day of Connellsville foundry coke for the remainder of the year at $6.50, ovens. Producers are unwilling to entertain business calling for delivery beyond Oct. 1. Sales of Connellsville furnace coke for spot shipment has been made at $5, ovens. The spread on Wise county foundry coke has been eliminated and the price quoted by most sellers is $8, ovens. In the New River district, producers report shipments of foundry coke increasing. There is practically no furnace coke being produced in that territory. By-product plants continue to ship their current production.

Revival of Iron Market

(*Concluded from Page* 1719)

60 days' supply. Some have tonnage coming on second quarter contracts to cover much of their third quarter requirements, because of the labor shortage limiting the melt. The market is on a substantial basis. There are no suspensions outside of an occasional request due to labor scarcity. Inquiry includes 2500 tons of foundry iron for June delivery for a Chicago melter. This still is unplaced. It is believed this is an attempt to break the market, but it has not succeeded. Lake Superior charcoal iron is dull, there is no inquiry and the price is unchanged. The sale of 250 tons of silvery iron to a Wisconsin user is noted. There is little inquiry for silveries and a concession of $1 is believed to be possible on attractive inquiry. Low phosphorus iron is not in demand, it is held at $37 to $38, delivered, Chicago.

Sales Best in Several Weeks

Cincinnati, O., June 12.—More activity is noted in the pig iron market. Sales of the past week exceeded those of any week since April. Buying in many instances is urgent, indicating consumers have waited as long as possible. However, strictly third quarter buying continues light, as melters are loath to contract beyond 30 days. The melt in this district has been heavy and yard stocks of foundries and other melters are comparatively small. While the southern Ohio market is quoted at $29, Ironton base, several sales involving fairly large tonnages have been made at $28, base. The southern market is firm at $27, Birmingham base. Surplus pig iron on Alabama furnace yards, according to word received here will not aggregate much more than 25,000 tons. The Norton Iron Works, is preparing to blow out its furnace in Kentucky. One or two other furnace interests contemplate similar action. Inquiry is in lots of 200 to 500 tons and sales have been in about equal proportion. So little resale iron has appeared in this market it has been absorbed without a ripple and has not had any effect upon the situation. The most important sale was 1000 tons of northern iron to a central Ohio consumer for June and July delivery. Other sales include, 500 tons of special analysis northern iron into the Chicago territory for prompt delivery; 500 tons of southern iron for immediate shipment to the West and 200 tons of northern foundry iron to a central Ohio melter for third quarter. A Dayton, O., consumer is about to close for 150 tons of malleable for prompt delivery. A sale of a carload of silvery iron to a consumer in this territory also is noted.

Eastern Sales Improve

Philadelphia, June 12.—Pig iron buying generally shows improvement. The number of consumers in the market has increased. Nevertheless the total of business continues small. In the past week it probably did not exceed 7500 tons. The most conspicuous transaction involved 1000 tons of copper-free low phosphorus iron bought by a Philadelphia consumer. This purchase involved English metal in stock here at a price considerably under the domestic market. This sale wipes out the stock of English low phosphorus iron here. The current market on domestic copper-free low phosphorus iron is $34.79 to $35.79, delivered Philadelphia. Most eastern makers continue to adhere to $29, base furnace, as the price for foundry iron, plus $1 silicon differentials. However, some shading has developed and several sales of No. 2 in the past week were made at $29.50, furnace. Stocks at some furnaces showed a slight increase during May. Resale iron continues to be offered, but not to any notable extent. Virginia foundry iron now is generally $28, base furnace, plus 50-cent silicon differentials.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	June 13, 1923	May 1923	Mar. 1923	June 1922
PIG IRON				
Bessemer, valley, del. Pitts.	$30.77	32.07	31.67	26.96
Basic, valley	27.50	29.80	29.80	25.00
*No. 2 foundry, del. Pittsburgh	29.77	31.91	31.37	25.96
*No. 2 foundry, Chicago	32.00	32.50	31.25	23.25
Lake Superior charcoal, Chicago	**36.65**	36.65	35.55	30.00
Malleable, valley	28.50	30.20	29.20	24.20
Malleable, Chicago	32.00	32.40	31.25	23.25
***Southern No. 2, Birmingham**	**27.00**	27.00	26.50	18.50
*Southern Ohio, No. 2, Ironton	28.00	31.00	30.75	23.25
Basic eastern del., eastern Pa.	28.14	30.75	29.35	25.25
**No. 2X, Virginia furnace	28.00	28.60	28.25	24.50
**No. 2X, eastern del., Phila.	30.76	32.76	32.00	27.20
Gray forge, val. del. Pittsburgh	29.27	31.17	30.77	25.96
Ferromanganese, del. Pitts.	129.79	129.79	120.79	72.82
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	42.50	45.40	44.50	35.00
Sheet bars, open-hearth, Pitts.	42.50	45.40	44.50	35.00
Billets, bessemer, Pittsburgh	42.50	45.00	44.50	35.00
Billets, open-hearth, Pittsburgh	42.50	45.00	44.50	35.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	**2.40**	2.40	2.30	1.65
Steel bars, Chicago	**2.50**	2.50	2.34	1.75
Steel bars, Philadelphia	2.77	2.77	2.67	2.01

	June 6, 1923	May 1923	Mar. 1923	June 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.72	2.82	2.70	1.96
Iron bars, Chicago mills	**2.60**	2.60	2.53	1.74
Beams, Pittsburgh	**2.50**	2.50	2.35	1.65
Beams, Philadelphia	2.82	2.87	2.77	2.01
Beams, Chicago	**2.60**	2.60	2.44	1.75
Tank plates, Pittsburgh	**2.50**	2.50	2.35	1.65
Tank plates, Philadelphia	2.87	2.92	2.77	2.01
Tank plates, Chicago	**2.60**	2.60	2.44	1.75
Sheets, blk., No. 28, Pittsburgh	3.85	3.85	3.55	3.15
Sheets, blue anl., No. 10, Pitts.	3.00	3.00	2.70	2.40
Sheets, galv., No. 28, Pittsburgh	**5.00**	5.00	4.65	4.15
Wire nails, Pittsburgh	3.00	3.00	2.90	2.40
COKE				
Connellsville furnace, ovens	4.50	5.10	7.15	6.60
Connellsville foundry, ovens	5.50	6.10	8.15	7.20
OLD MATERIAL				
Heavy melting steel, Pittsburgh	20.50	22.20	26.10	17.40
Heavy melting steel, eastern Pa.	19.00	20.40	24.85	15.30
Heavy melting steel, Chicago	17.50	19.75	23.15	14.45
No. 1 wrought, eastern Pa.	23.50	24.40	27.60	17.50
No. 1 wrought, Chicago	16.75	19.95	23.25	14.20
Rails for rolling, Chicago	19.50	21.80	24.90	15.40

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products Yesterday, Oone Week, One Month, Three Months, One Year and Ten Years Ago

June 13, 1923	June 6, 1923	May, 1923	March, 1923	June, 1922	June, 1913
$46.53	$46.79	$47.52	$45.31	$36.96	$26.78

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Takes Over Plant

The Landhaar Ball-Bearing Co., Cincinnati, has been incorporated with $10,000 capital stock by B. Lee Hutchinson. This concern will take over the Landhaar Ball-Bearing Co., of Aurora, Ind. The plant will remain at Aurora, but the main offices will be located in Cincinnati.

Iron and Steel Prices

SCRAP PRICES, PAGE 1782, WAREHOUSE PAGE 1774, ORE,. NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1778

Pig Iron

Bessemer, valley	$29.00
Bessemer, Pittsburgh	30.77
Basic, valley	27.50
Basic, Pittsburgh	29.27
Basic, Buffalo	29.00
Basic, del., eastern Pa.	28.14 to 28.50
Malleable, valley	28.00 to 29.00
Malleable, Pittsburgh	30.27 to 30.77
Malleable, Chicago	32.00
Malleable, Buffalo	29.00
Malleable, del., eastern Pa.	31.00 to 31.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry.	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	31.76 to 32.13
No. 1X Buffalo	30.00
No. 2 foundry, valley	28.00 to 28.50
No. 2 foundry, Pittsburgh	29.77 to 30.27
No. 2 foundry, Buffalo	29.00
No. 2 foundry, Chicago	32.00
No. 2 foundry, Granite City	33.00 to 34.00
No. 2 foundry, Ironton fur.	28.00 to 29.00
No. 2 foundry, Cleveland del.	30.27 to 30.77
No. 2 foundry, del. Phila.	29.76 to 30.13
No. 2 foundry, N. J. tidewater	30.13 to 30.64
No. 2X, eastern del., Phila.	30.63 to 31.13
No. 2X, east. N. J., tidewater	31.13 to 31.64
No. 2X, eastern del. Boston	33.15 to 33.65
No. 2X foundry, Buffalo fur.	29.50
No. 2X, Buffalo, del. Boston	33.92 to 34.42
No. 2 southern, Birmingham	27.00
No. 2 southern, Cincinnati	31.05
No. 2 southern, Chicago	33.01
No. 2 southern, Philadelphia	33.80
No. 2 southern, Cleveland	33.01
No. 2 southern, Boston (rail and water)	33.41 to 33.91
No. 2 southern, St. Louis	32.17
No. 2X, Virginia furnace	28.00 to 28.50
No. 2X, Virginia, Phila.	33.27 to 33.57
No. 2X, Virginia, Jersey City	33.54 to 34.04
No. 2X, Virginia, Boston	33.92 to 34.42
Gray forge, eastern Pa.	28.00 to 29.00
Gray forge, val., del. Pitts.	29.27 to 29.77
Low phos., standard, valley	36.00
Low phos., standard, Phila.	34.79 to 35.79
Low phos., Lebanon furnace	33.00
Charcoal, Birmingham	34.00 to 35.00
Charcoal, Superior, Chicago	36.65

Silvery Iron

Jackson County, Ohio, furnace

8 to 9 per cent	$39.50
9 to 10 per cent	41.50
10 to 11 per cent	43.50
11 to 12 per cent	46.50
12 per cent	48.50
13 per cent	51.00

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	$48.50
11 to 12 per cent	51.80

Ferroalloys

Ferromanganese 78 to 82 per cent, domestic, seaboard or furnace	$125.00
Ferromanganese, delivered, Pittsburgh	129.79
†Ferromanganese, 79 per cent English c.i.f. seaboard	125.00
Spiegeleisen 19 to 21 per cent furnace or tidewater, contract	45.00 to 47.50
Spiegeleisen 19 to 21 per cent furnace or tidewater, spot	50.00
Ferrosilicon, 50 per cent contract freight allowed	90.00 to 95.00
Ferrotungsten standard, per pound contained	92.50 to 97.50
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	12.00

†Duty paid.

Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$4.75 to 5.75
Connellsville foundry	5.50 to 6.50
New River furnace	9.50 to 10.00
New River foundry	12.50 to 13.00
Wise county furnace	6.25 to 6.75
Wise county foundry	8.00
Alabama furnace	7.50 to 8.00
Alabama foundry	8.50 to 9.00

By-Product

Foundry, Newark, N. J., del.	$11.84 to 11.91
Foundry, Chicago, ovens	15.00
Foundry, Boston, delivered	16.00
Foundry, Granite City, Ill.	14.00
Foundry, Alabama	8.50 to 9.00

Semifinished Material

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$42.50 to 45.00
Open-hearth, Youngstown	42.50 to 45.00
Open-hearth, Philadelphia	48.17 to 50.17
Bessemer, Pittsburgh	42.50 to 45.00
Bessemer, Youngstown	42.50 to 45.00
Forging, Pittsburgh	55.00
Forging, Philadelphia	56.17 to 60.17

SHEET BARS

Open-hearth, Pittsburgh	$42.50 to 45.00
Open-hearth, Youngstown	42.50 to 45.00
Bessemer, Pittsburgh	42.50 to 45.00
Bessemer, Youngstown	42.50 to 45.00

SLABS

Pittsburgh	$42.50 to 45.00
Youngstown	42.50 to 45.00

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh	$51.00 to 55.00

SKELP

Grooved skelp, Pittsburgh	2.45c
Universal skelp, Pittsburgh	2.45c
Sheared skelp, Pittsburgh	2.45c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.50c to 2.60c
Structural shapes, Phila.	2.82c
Structural shapes, New York	2.84c
Structural shapes, Chicago	2.60c to 2.70c
Tank plates, Pittsburgh	2.50c to 2.60c
Tank plates, Philadelphia	2.82c to 2.92c
Tank plates, New York	2.84c to 2.94c
Tank plates, Chicago	2.60c to 2.80c
Bars, soft steel, Pittsburgh	2.40c to 2.50c
Bars, soft steel, Philadelphia	2.72c to 2.82c
Bars, soft steel, New York	2.74c to 2.84c
Bars, soft steel, Chicago	2.50c to 2.60c
Bars, refined iron, Pittsburgh	3.20c to 4.85c
Bars, rail steel, Chicago	2.30c
Reinforcing bars, Pittsburgh	2.40c
Bar iron, common, Phila.	2.72c to 2.82c
Bar iron, common, New York	2.74c to 2.84c
Bar iron, common, Chicago	2.60c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	3.15c to 3.30c
Hoops, Pittsburgh, small	3.50c
Bands, Pittsburgh	3.15c to 3.30c
Cold finished steel bars, Pittsburgh base	3.25c
Steel shafting, Pittsburgh	3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.50

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	30.00 to 39.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.75c
Spikes, boat and barge, Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	3.25c
Track bolts, Pittsburgh	4.25c to 5.50c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c to 2.75c
Tie plates, Chicago	2.60c

Spike, tie plate and track bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Wire nails, Pittsburgh	3.00c to 3.10c
Plain wire, Pittsburgh	2.75c to 3.00c
Annealed wire, Pittsburgh	2.90c to 3.20c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c to 3.60c
Barbed wire, painted, Pitts.	3.45c to 3.70c
Barber wire, galv., Pittsburgh	3.80c to 4.05c
Polished staples, Pittsburgh	3.45c to 3.65c
Galvanized staples, Pittsburgh	3.80c to 4.05c
Coated nails, count keg, Pitts.	2.70c to 2.75c
Woven wire fencing (retailers)	.65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburgh stamping quality	3.15c to 3.30c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	5.29c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	4.07c to 4.17c
No. 28, open-hearth, Chicago	4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, open-hearth, Chicago	3.84c to 4.34c

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c
No. 28 bessemer, Pittsburgh	5.00c
No. 28, open-hearth, Phila.	5.32c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c to 3.25c
No. 10, bessemer, Pittsburgh	3.00c to 3.25c
No. 10, open-hearth, Phila.	3.32c to 3.57c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c to 5.70c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$5.50 to $6.00

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	61 to 62	49½ to 50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	$61.20 to 63.20
Six-inch and over, Chicago	$7.20 to 59.20
Four-inch, Birmingham	$3.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	63.60 to 65.50
Six-inch and over, New York	59.00 to 60.00
Three-inch, Birmingham	59.00 to 60.00

Class A pipe is $5 higher than Class B.

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4 inch, plus $20; 3 inch, plus $20; gas pipe fittings, $5 higher.

Scrap Activity on Decline

All Grades Are Reported Dull—Prices Continue To Taper Off with Lack of Buying—Railroad Offerings Are Plentiful

SCRAP PRICES, PAGE 1782

Chicago, June 12.—Declines ranging from 50 cents to $2 per ton with the majority ranging between $1 and $1.50, have been met on most grades of iron and steel scrap in the past few days. Consumers are consistently out of the market and cannot be interested in a further supply. Most users of heavy melting steel and open-hearth grades have sufficient scrap on their yards or under contract to take care of their requirements for some time. Other users appear to have sufficient for their needs. One reason for the abrupt decline at present is that all orders have been filled and only a small short interest remains in the market. This has stopped buying by dealers to apply on their obligations and has removed this support from the market. Railroad offerings are relatively heavy and prices realized for this scrap are much below those prevailing a month ago. Lack of labor to sort and prepare railroad scrap is resulting in considerable mixed and uncut scrap being offered. Inasmuch as scrap dealers are also handicapped by lack of labor this sort of scrap is not sold readily. The Louisville & Nashville railroad offers 9900 tons, the Wabash railroad 5400 tons, the Norfolk & Western railroad 3400 tons, the Nickel Plate railroad 1560 tons, the Chesapeake & Ohio railroad 4200 tons, the Chicago Great Western railroad 700 tons the Central of Georgia 400 tons and the Lake Erie & Western 400 tons.

Trading Again Quiet

Boston, June 12.—Activity in the scrap iron and steel market in New England has failed to develop along lines indicated early in the month. Steelmakers of Pennsylvania have been in the market for heavy melting scrap, but districts closer to consuming points have taken most of the business. Boston dealers, while anxious to sell steel, seem to have remarkable confidence in recovery of prices and, therefore, refuse to meet the New York dealers' quotations to central Pennsylvania and Pittsburgh district consumers. Small lots of heavy melting steel have sold at Boston at $15.50 for delivery to consumers within the district. Offers from Pittsburgh consumers have been at prices which would mean $14 eastern New England shipping point and this price dealers are not willing to meet. Cast grades, on the other hand, are considerably softer as a result of softening in pig iron prices. One foundry bought 300 tons of No. 1 machinery scrap at $24 delivered and sales of scrap of slightly inferior quality have been reported at $23 delivered to eastern Massachusetts points. Trading generally is dull. Several hundred tons of stove plate exchanged hands, two cars of malleable and some wrought pipe.

Mills Must Re-enter Market

Buffalo, June 12.—The market for scrap has settled down to a better basis. Although buying is not in evidence, the feeling is better and dealers are confident purchasing cannot be much longer delayed. All old orders are now out of the way and with heavy consumption going on, mills must reenter the market. Dealers have learned a lesson in the matter of keeping to specifications and it is probable that for a whole while at least, future shipments of scrap will be of better quality. The number of rejections by Buffalo mills over the past month, has been unprecedented in this district and has caused dealers heavy loss.

Buying Movement Expected

Cleveland, June 12.—Iron and steel scrap is quiet in the Cleveland district although inquiries from users are taken by dealers as an indication that a buying movement is not far distant. Prices are unchanged and fairly firm.

All Grades Continue Dull

St. Louis, June 11.—Further prunning has been made to scrap iron and steel prices, the cuts affecting virtually all grades. The market continues dull, and dealers are having difficulty selling, even at the concessions offered. Most buyers are well supplied for the next few months, and believe they can fill future needs with little difficulty. Stocks are increasing, and complaints of rejections by the mills and foundries are growing more numerous. Because of these rejections, dealers are making special effort to have their cars up to specifications.

All grades are reported dull, but apathy is especially marked in material for foundries and rolling mills. Cast scrap is plentiful and cheaper, No. 1 having been reduced $1 to $20.50. Cuts of $2 per ton were made in iron rails, iron and steel car axles, railroad malleable, and agricultural cast. Reductions of from 50 cents to $1 were general through the list. Certain varieties of unprepared yard scrap are being offered at surprisingly low figures, in fact, purchasers can almost name their own price. With the summer months approaching, the outlook for improvement is not particularly bright.

Weakness has been emphasized by the liberal offerings of the railroads. Favorable weather has enabled them to handle their accumulations of old material and move it forward. Singularly enough, however, the carriers have been getting fairly good prices, general conditions considered. Recent offerings by the roads include the following: Wabash, 1500 tons of rails; Frisco, 1000 tons; Pennsylvania, Southwestern Region, 5000 tons; Kansas City Southern, 300 tons; Texas and Pacific, 1600 tons; Baltimore and Ohio, 40 cars and 16,000 tons, and smaller tonnages by other lines aggregating about 2500 tons.

More Weakness Shown

Birmingham, Ala., June 11.—The scrap iron and steel market shows further weakness and various grades can be bought at a little lower price than obtained a short while back. Dealers have plenty of stock, following the policy of keeping the yards well supplied and replacing the old material as quickly as it is moved out. Heavy melting steel commands little attention. No. 1 cast and stove plate still are showing some life but contracts are few and far between The small lot business which is being received is for early delivery. Transportation is satisfactory. Orders in hand cover at least six weeks.

Scrap Prices Are Reduced

New York, June 12.—Further weakness is seen in the local scrap market. Heavy melting steel and No. 1 railroad steel each have slumped off 50 cents and similar reductions have been noted in certain other grades, particularly in cast and wrought material.

(*Concluded on Page* 1731)

Quiet Market

Continues in Ferroalloys—Prices Unchanged—Important Inquiries

FERROALLOY PRICES, PAGE 1721

New York, June 12.—Demand for ferromanganese continues quiet. The price on both spot and third quarter metal continues unchanged at $125 duty paid tidewater. As previously reported domestic ferromanganese continues obtainable for fourth quarter delivery at $120 tidewater.

Several hundred tons of spiegeleisen have been sold during the past week at $45 furnace, for 20 per cent metal, for forward shipment, and at $50 for spot carloads.

A fair inquiry for 50 per cent ferrosilicon for third quarter and last half shipments has been in the market. Carlots have been selling at $95, delivered. Some fair orders for ferrotungsten and tungsten powder have been placed and other inquiries are pending. Crucible Steel Co. has been in the market for some 60,000 or 70,000 pounds of manufactured tungsten. Bethlehem Steel Co. recently inquired for 25,000 pounds and is reported to have closed. Quotation on ferrotungsten is unchanged at 95 cents a pound contained, with several sales at this figure; powder, $1 a pound with sales at this price and a shade higher. Ferrochrome prices are unchanged. Ferrovanadium prices are unchanged, with a good volume of business in the tool steel grades, at $3.75 a pound contained.

Buy Ferro at $125, Seaboard

Chicago, June 12.—Ferromanganese is being brought in small lots at $125, seaboard, for prompt and third quarter delivery. Spiegeleisen is quiet.

$120 Price Is Withdrawn

Philadelphia, June 12.—The $120 price on domestic ferromanganese for last quarter delivery has been withdrawn. Only one price now is being named on first half delivery for any material and this is $125, duty paid tidewater or furnace. Small quantities of resale ferromanganese are obtainable below this figure.

Very little demand for ferromanganese is in the market at present. Some carload sales of spiegeleisen are being made at $50, furnace, with the nominal quota-

tion on larger lots $45 to $47.50, furnace.

Wire and Nails

Continue In Good Demand; No Indications of Weakness Shown

WIRE PRICES, PAGE 1721

Pittsburgh, June 12.—Bright wire and nails continue in good demand according to wire product makers here who have good order books generally applying to all they make. Practically all the output for the third quarter already is obligated and disinclined as they are to take orders so far ahead as for October delivery, there is an absence of price weakness. The general market is quoted at 2.75c on wire and 3.00c, base Pittsburgh, on wire nails, although one or two makers are obtaining higher figures, such as the Bethlehem Steel Co. which quotes 3.00c on wire or 3.10c on nails. Representative independent producers of bright wire are allocating their production among their regular customers. Buying of fencing is not as heavy as was expected, although purchasers of mixed carloads of barbed wire, staples and fencing are fairly numerous. Wire plants still are short of labor and on that account are unable to bring the average operation up to above 80 per cent.

New England Takes More Wire

Boston, June 12.—Orders for wire and wire products have improved in this market since the first of the month. One interest reports closing on over 3000 tons during the week and inquiry before the trade at present probably exceeds this amount. One consumer is asking for 3000 kegs of nails. Prices are slightly softer although nowhere quoted below the Corporation levels.

Demand Continues Heavy

Buffalo, June 12.—Wiremakers can see no signs of a letup in the heavy demand which has been a feature of the market for over a year. The Wickwire-Spencer Steel Corp. is increasing its capacity by installing extra drawing equipment. Deliveries are not being promised for less than 60 days. Mills are running day and night. The automobile business is supplying a large proportion of the demand. Wiremakers are manufacturing springs, rivet wire, bolt wire, cold rolled flat wire for fenders, etc. ,and flat springs for carburetors. Hardware cloth is now being used in ½-inch mesh for the bottoms of seats as supports. Cotter pin wire also is in demand in the automobile trade. Reinforcing material for roadways is being sold to Pacific coast states.

New Demand Tapers Off

Chicago, June 12.—With June normally a dull season for buying of wire and nails, demand has fallen off though not to an extent that makes it necessary for producers to seek business. Most makers are willing to take on some tonnage from their regular customers. Buyers insist on quick delivery of material on contract. Jobbers have moderate stocks, but dealers have practically no material on hand. The market is firm at the established prices and no shading is noted.

Sheet Bar Price Softens

Regular Mill Patrons To Be Supplied Third Quarter Tonnage at $42.50—Open Market Figures up to $45

SEMIFINISHED STEEL PRICES, PAGE 1721

Pittsburgh, June 11.—A price of $42.50, Pittsburgh or Youngstown, is applying on business taken for the third quarter for regular sheet bar customers of large mills here. It has developed, however, by some large users that in the open market $44 and $45, Pittsburgh or Youngstown are the going quotations. One interest, which plans to shut down its finishing department for a week or two but desires to keep the steel mill operating, recently disposed of the excess sheet bar tonnage to be produced, at $43.50, Pittsburgh, but the buyer on endeavoring to increase his order was told that no more bars were available at that figure. Several inquiries are out here for sheet bar tonnage, as well as for billets and slabs. One new inquiry for slabs calls for more than 1000 tons; on this $45, Pittsburgh, was quoted. One inquiry for billets involves 2000 tons and a similar tonnage of alloy billets is up for negotiation. The prevailing figure on the rerollers is $45, while on the alloy billets $80 is quoted.

Forging billets are fairly active. One recent order at $55, Pittsburgh involves 200 tons and that figure applies on an inquiry for about 500 tons from an oil well supply interest. Reports of concessions to $52.50, Pittsburgh, originate in Philadelphia, but locally the market is firm at $55.

The supply of available wire rods still is limited and the market is quotable at $51 to $55, Pittsburgh. A more liberal supply of skelp is available, since pipe mills generally cannot operate at a sufficiently high rate to use it up, due to a labor shortage. One interest reports, however, users of its boiler tube and wheel skelp are taking every pound on contract and asking for more. The market is quoted at 2.45c, base Pittsburgh.

Will Revise Contracts

Youngstown, O., June 12.—Consumers of sheet bars have been endeavoring for the past few weeks to impress makers with the fact that not many months ago when black sheets were selling at 4.35c sheet bars were being purchased at $45, whereas today producers of sheet bars are asking $45 a ton with black sheets commanding 3.85c, or $10 a ton lower. Using this as a wedge customers of one producer here have been successful in obtaining their third quarter contract sheet bars at $42.50, Youngstown, and the belief is that the price of $45, Youngstown, recently written in a number of third quarter contracts will be revised accordingly, by certain active producers. Last week three producers outside this district quoted sheet bars for immediate rolling at $44, Pittsburgh. Little free tonnage of semifinished is available at mills in this district.

Some Sales Made at $42.50

Cleveland, June 2.—The market for semifinished material here is quiet, though there have been some small sales of sheet bars into this district for June delivery on a basis of $42.50, and the market is regarded as $42.50 to $44, Pittsburgh and Youngstown. The leading maker is fully committed for the third quarter and has not taken any additional tonnage. Some of the sheet bar users in this territory who have not yet covered on their third quarter needs are beginning to sound out the market. Forging billets now are quoted by eastern mills at $55, Pittsburgh.

Eastern Sales Light

Philadelphia, June 12.—Billet sales are moderate, including 500 to 1000 tons of forging quality at $53 to $55, Pittsburgh, or $58.17 to $60.17, delivered, Philadelphia. Not much demand is noted for rerolling billets and the price is nominal at $43 to $45, Pittsburgh, or $47.17 to $50.17, delivered, Philadelphia.

Wire rod supplies are more plentiful. The minimum price is $51, Pittsburgh, with small tonnages somewhat higher.

Warehouse Demand Shows Slight Falling Off

WAREHOUSE PRICES, PAGE 1778

Philadelphia, June 12.—Local jobbers continue to maintain firmly prices on iron and steel shipments from stock for Philadelphia delivery. However, concessions have been named on out-of-town shipments to meet competition from New York and Baltimore. Local jobbers now are quoting 3.47c, base Pittsburgh, on bars for out-of-town shipment, 3.57c on plates, shapes and 4.27c on bands. The volume of demand continues maintained.

Business Continues Brisk

New York, June 12.—Steadiness characterizes the local jobbing market. Sellers report that demand is being maintained at the rate prevailing in May, and while business in that month was less active than in April, nevertheless, it was brisk. Prices, at the same time, have shown little change over the past month. Mill prices in some instances are a little easier, but this is principally in premiums. Shapes and reinforcing bars continue in outstanding demand.

Letup in Demand Felt

Detroit, June 12.—Jobbers in iron and steel are feeling the effects of curtailment in building lines and in some of the smaller industries. While orders are numerous dealers are finding the quantity of individual orders reduced. Dealers say this condition is not unusual at this time of the year. Demand for bars, both soft steel and iron, has fallen off. Inquiry for sheets has shown some hesitancy. Stocks are lower at present than they were a few weeks ago. Supplies of small structural shapes are decidedly low in some quarters. Demand for the smaller sizes has been strong recently owing to the large amount of building repair work. Prices are steady. Shipments from the mills are fair.

Bar Demands Are Steady

Consumers Buying on Liberal Scale for Third Quarter—Some July Specifications Already Are In—Prices Firm

BAR PRICES, PAGE 1721

Chicago, June 12.—While booking of soft steel bar tonnages is undeniably less than during the past few weeks, the market is on a firm and steady basis. It has moved from the abnormal and more or less hysterical stage to a much saner foundation. Increasing confidence in the business situation is in evidence and business men generally believe conditions are much more desirable. Apparently the bar market contains no reason for alarm, with inquiry and specifications coming at a steady pace, which gives every evidence of continuing over a long period. Bar mills still find their principal problem is in making shipments to meet the wishes of consumers and under present conditions of enlarged production, consumers are receiving material much more nearly on the schedule they desire. No cancellations or suspensons are being received and pressure for delivery continues strong.

An eastern mill has recently sold several hundred tons of soft steel bars in Chicago at 2.50c, Pittsburgh, for June delivery. This was made possible by a small tonnage of steel becoming available and consumers have taken it gladly at a slight premium. Soft steel bars at Chicago are quoted at 2.30c, delivered at convenience, while some nearby tonnage in small lots has commanded 2.60c, Chicago mill.

Bar iron continues strong at 2.60c, Chicago mill, and both new buying and specifications on contracts are excellent. Rail steel bars continue to be quoted at 2.30c, mill, and demand continues steady.

Buying On Liberal Scale

Pittsburgh, June 12.—Buying of merchant steel bars for third quarter delivery is of liberal proportions. The majority of purchases are confined to cold-drawn steels bars for the drop forge and specialty industry, although other representative buyers are furnishing their quota of the business. Aggregate bookings by the larger producers in this vicinity keep their order books in good shape, notwithstanding the fact that steel mill operations still average over 90 per cent. Deliveries are much deferred although they are being made at a better rate than earlier in the second quarter. Specifications against contract and shipments are heavy, indicating that the consuming rate still is large. Some specifications for July tonnages already are at hand. The price is unchanged at 2.40c, base, Pittsburgh, although some buyers look for lower figures. The situation as regards refined iron is unchanged. The demand is as heavy as it has been for several weeks and prices range from 3.20c to 4.85c, Pittsburgh.

Deliveries Are Easing Up

Philadelphia, June 12.—Specifications against steel bar contracts continue heavy. However, the mills are catching up to some extent on their delivery schedules and the available supply of material is somewhat easier. In numerous instances consumers have obtained bars for nearby shipment at a minimum of 2.40c, Pittsburgh, equivalent to 2.72c, Philadelphia. Considerable miscellaneous business, however, continues to be taken at 2.45c and 2.50c, Pittsburgh. Third quarter contracts for steel bars continue to be made at 2.40c, Pittsburgh.

New Business Is Modest

Cleveland, June 12.—Buyers still are very conservative in placing additional tonnages except where fill-in needs are developing. In this way some new business continues to be placed but the aggregate volume is not large. There is practically no buying for forward delivery. Consumers are keeping after deliveries from the mills as intently as ever and deliveries with the larger producers have not changed appreciably. Prices are steady at a minimum of 2.40c, Pittsburgh for prolonged shipment. Premiums still are obtainable where quick delivery can be promised. One lot of bars for shipment within a few weeks went to a valley maker at 2.45c, Pittsburgh. Heavy hoops and bands continue to be quoted generally at 3.15c, Pittsburgh. The 3.15c price is reported to have been shaded in some cases. Light hoops and bands range from 3.50c to 3.75c, Pittsburgh.

Cold Rolled Bars Active

Pittsburgh, June 12.—Business coming to the cold-drawn bar finishers in this territory is diversified as ever, and continues of pleasng proportions. Many buyers pursue a conservative course in regard to forward purchases but that is in harmony with makers' wishes. On some sizes, deliveries are behind two or three months while in others fairly prompt shipment can be made. The automotive trade is holding back a trifle. Other lines of industry make up for this lack and representative purchasers have protected their needs for all or at least a portion of the thrid quarter. The price is unchanged at 3.25c, base, Pittsburgh, which on the basis of 2.40c, for merchant bars, with a $3 extra for screw stock, gives but $14 per ton for conversion which makers claim is not enough based on present high costs and operations. Interspersing numerous single carload offers, are a few involving 500 tons each or larger.

Taking Third Quarter Nuts, Bolts Lower

NUT AND BOLT PRICES, PAGE 1778

Pittsburgh, June 12.—Inquiries for bolts and nuts are fairly numerous and it is expected that many will be closed within the next few days. Makers are taking third quarter contracts on the basis of 50 and 10 off for large machine bolts. While the quoted price has been 40 and 10 off for some time past, this level and others going with it have represented the minority of the tonnages closed, the 40 and 10 basis not having been definite or decided on as the going level. Nuts are quoted at $3 and $3.25 off list instead of $2.75 and $3 off as carried for some time. Some buyers located farther east report ability to buy machine bolts at 50, 10 and 10 off, but in this vicinity it applies only to small machine bolts.

Some business is structural and boiler rivets is being done in carload lots at 3.25c and 3.35c, base Pittsburgh, respectively.

The revised price list on nuts and bolts follows:

NUTS AND BOLTS

(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank	$3.25 off
Hot pressed square or hexagon tapped	$3.00 off
Cold punched square or hexagon blank	$3.25 off
Cold punched square or hexagon tapped	$3.00 off
Cold punched semfinished hexagon nuts, 5-8-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts, 9-16-inch and smaller	70-10-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

(¾x6-inches, smaller and shorter)

Rolled thread	50 off
Cut thread	50-10 off
Larger and longer	50-10 off

MACHINE BOLTS

(⅜x4 inches hot pressed nuts)

Rolled thread	50-10-10 off
Cut thread	50-10 off
Larger and longer	50-10 off

(⅜x4 inches, cold punched nuts)

Cut thread	45 off
Larger and longer	45 off
Lag screws	60 off
Plow bolts Nos. 1, 2 and 3 heads	50-10 off
Plow bolts Nos. 4 to 10 heads	50-10 plus 20 off
Stove bolts	75-5 off
Tap bolts	25 off
Bolt ends with hot pressed nuts	50-10 off
Bolt ends with cold punched nuts	45 off
Blank bolts	50-10 off
Rough stud bolts with nuts	50-10 off

WASHERS

Wrought washers	$4.85 to $5.00 off

Future Prospects Are Bright

Cleveland, June 12.—Some makers of bolts and nuts in this vicinity are reporting more favorable business than in a number of weeks past. Plants are running better than full turn and order books are well filled. Recent orders have been for various sizes, indicating that consumers stocks are becoming depleted. Inquiries and orders are coming from all lines of industry indicating that the demand is general. In most cases early delivery is specified. Makers feel that prospects for future business are good and that the recent slump will result in more serious buying. Prices remain unchanged and firm.

Specifications against rivet contracts are continuing heavy and new business remains about the same as a week ago. The leading rivet maker is quoting 3.25c and 3.35c on structural and boiler rivets, respectively.

New Contracts Being Made

Chicago, June 12.—Booking of bolts and nuts on contracts for third quarter delivery has started and, while there is no rush to cover, users of this material are filing their contracts steadily and are taking their normal tonnage for this period. The schedule of discounts which has been in effect for some time

is applying on this business and is the same as the prices paid for second quarter contracts tonnage.

Hoops, Bands Steady

HOOP PRICES, PAGE 1721

Pittsburgh, June 12.—The situation on hoops and bands is no easier and builders are as much deferred as ever due to heavy bookings of late. In some cases purchasers have covered for their entire third quarter needs and others still have some tonnage to place. Deliveries are from 6 to 12 weeks deferred. So far the letup in automotive buying has not been severe and while it is expected to develop along more decided lines in July other consuming lines will doubtless make up for this lack. The market is unchanged at 3.15c to 3.30c, base, Pittsburgh. The former figure is made up of certain large interests to a few preferred buyers of large tonnage who always have been upon their books.

Furnaces Taking Heavy Ore Shipments

ORE PRICES, PAGE 1778

Cleveland, June 12.—Record production of pig iron continues to be reflected in heavy shipments of Lake Superior iron ore to the furnaces. Shipments from Lake Erie docks to furnaces in May totaled 4,041,956 tons, compared to 1,037,124 tons in May, 1922; and the total for this year to June 1 was 5,894,678, compared to 1,725,139 tons in the first five months of 1922. Following are comparisons of shipments from ports, and balances on dock June 1:

	Shipments May	Shipments Season	Balance on dock 1923,
Buffalo and Port Colborne, Ont..	176,730	229,274	170,617
Erie	200,069	310,941	237,425
Conneaut	847,368	1,248,440	865,707
Ashtabula	1,209,696	1,756,802	922,404
Fairport	229,262	277,586	205,318
Cleveland	813,019	1,141,519	1,014,983
Lorain	267,417	446,173	198,603
Huron	152,981	288,558	591,171
Toledo	145,414	195,385	141,043
Total Lake Erie	4,041,956	5,894,678	4,347,271
Comparative total year previous	1,037,124	1,725,139	6,493,045

Dictionary of Commodity Specification Planned

Washington, June 12.—Representatives of business associations, including the Society for Testing Materials, American Engineering Standards committee, Society of Automotive Engineers and National Manufacturers' association, yesterday pledged to Secretary of Commerce Hoover their support of his proposal to set up a dictionary of commodity specifications. At the outset standards and specifications for government purchases only will be promulgated, but as the work progresses and is understood it is hoped to extend it to all state, municipal and institutional purchasing. By having definite specifications apply to all governmental purchases great economies can be effected, Secretary Hoover believes. No standards will be set up until after consultation with the interested industry.

Railroads Ordering Plates

Pennsylvania Lines Close for 20,000 Tons of Material—Hetch Hetchy Award of 24,700 Tons Made—Barges Call for Tonnage

PLATE PRICES, PAGE 1721

Philadelphia, June 12.—The plate market is featured by big railroad buying. The Pennsylvania lines finally placed their third quarter requirements and it is understood the total was 20,000 tons of plates shapes and bars. The Reading placed 1500 tons of plates. Other current business is comprised mostly of small and moderate lots.

Production continues heavy. One eastern mill last week broke its record for shipments. However, new orders are not large enough to replace shipments on order books. The market continues at 2.50c to 2.60c, base Pittsburgh, equivalent to 2.82c to 2.92c, Philadelphia. The price of 2.60c applies on most current business for nearby shipment, although larger orders for nearby shipment are going at 2.50c. So far as known 2.50c has not been shaded for any delivery, despite some reports to the contrary.

Awards Involve Heavy Tonnage

Chicago, June 12.—After a period of quietness, inquiry for steel plates for oil storage tanks is beginning to come out. The Magnolia Petroleum Co. has let 20 tanks of 55,000 barrels capacity for prompt delivery to the United Iron Works. These will absorb 4200 tons of plates. The government has put out an inquiry for 16 barges for river service, requiring about 18,000 tons. The most important development in the plate market is the placing of contract for 24,700 tons of steel for the Hetch Hetchy project at San Francisco. A tank manufacturer in the West is asking for protection on plates for 150 tank cars. The Pere Marquette railroad is inquiring for two car ferries and the American Shipbuilding Co., is planning to build three freight carriers which are to be sold. Tank plates are quoted at 2.60c, Chicago mill, for delivery at convenience, while some tonnages for third quarter delivery have moved at 2.80c, Chicago mill.

Places 5000 Tons of Plates

New York, May 12.—The Genreal Petroleum Co., which recently inquired for 4800 to 5000 tons of tank plates has placed this tonnage through its California office but details have not been announced here. The new plate demand generally continues restricted to small lots. The plate market continues to be quoted at 2.50c to 2.60c, base Pittsburgh. It is easy to buy plates for early delivery at 2.60c while on attractive lots for early delivery the minimum price of 2.50c can be done.

Room For More Tonnage

Pittsburgh, June 12.—While the booking of plates has been somewhat heavier than that of structural shapes, there still is room on several makers' books for tonnage. Notwithstanding this fact the market is firm at 2.50c, base Pittsburgh. Most of the inquiries now coming out for plate tonnage are relatively small. While a number range from 500 to 1000 tons an occasional one develops a larger tonnage. Tanks for the General Petroleum Corp. for installation on the Pacific coast will require 4500 tons. The strength of the 2.50c price is shown by the fact that last week one of the Mahoning valley plants took some small orders for plates at 2.60c, Youngstown mill. Some of the fabricators have booked their requirements with the mills for third quarter; others still have tonnage to place. One or two have asked for protection on lots up to 2000 tons.

Car Ferries in Market

Cleveland, June 12.—Definite inquiries now have been put out by the Pere Marquette railroad for one or two car ferries which will require 2600 to 5200 tons of steel, largely plates. This road has been considering the purchase of these ferries for some time but has only definitely decided to take bids within the past week. No action has been taken on the one to three freight vessels requiring up to 10,000 tons upon the construction of which a lake yard is figuring. An inquiry for 100 to 200 coal cars for the Pittsburgh & Bessemer Coal Co. involves 900 to 1800 tons of steel, mostly plates. The plate market has shown no material change the past week. The tonnage is of miscellaneous character and usually not in heavy lots. Prices are firm at a minimum of 2.50c, Pittsburgh, with the larger mills for deferred delivery. Premium mills are quoting 2.65c, Pittsburgh, an eastern mill and upward. Local mills are naming 2.65c Pittsburgh. On tank steel this price is reported to have been shaded. Eastern mills are able to make better deliveries or from four to five weeks as against six to eight weeks recently.

Railroad Advisory Boards Are Being Organized

Washington, June 12.—The American Railway association has announced the creation of five regional advisory boards to bring together the railroads and shippers in the interest of intelligent co-operation in railroad matters. Boards will shortly be announced for the regions covered by the association's representatives at New York, Chicago, Cincinnati and Toledo, O.

A. S. Lucas, of the United States Cast Iron Pipe & Foundry Co., Birmingham, Ala., represents the iron and steel industry in the southeastern board; S. L. Yerkees, also of Birmingham, coal and coke, and J. S. Waterman, of Atlanta, sand, gravel and slag. Coal, coke and lignite interests in the southwestern region are represented on the southwestern board by A. P. Rudowsky, of McAlester, Okla. On the trans-Missouri, Kansas board are T. O. Vest, of the Hegeler Zinc Co., Joplin, Mo., and A. M. Gaines, representing the zinc and lead ore interests of Picher, Okla.

Reinforcing Bars Pick Up

Actual Closing of Business Still Small but Inquiries Forecast Better Business—Prices Remain Unchanged—Deliveries More Prompt

REINFORCING BAR PRICES, PAGE 1721

Chicago June 12—While a satisfactory total of reinforcing bars is being sold by Chicago dealers, most of the tonnage is in small lots. Projects requiring over 100 tons each are not as numerous as earlier in the season. There are sufficient large orders to keep the market active and prospective tonnages are coming out constantly giving promise of a active season in spite of the present relative lull. Chicago dealers continue to quote 3.15c, Chicago warehouse, and it has not been determined whether they will increase the quotation in view of the advanced price they must pay for third quarter bars.

New Inquiries on Increase

New York, June 12.—While active lettings of concrete reinforcing bars in this district continue small, new inquiry is increasing somewhat. Most of it, however, involves small lots. There is more competition for the work that is coming out, due to the fact that the mills are in a better position to make shipment. Prices generally, however, are firmly held. The market on mill shipments may be quoted at 2.40c to 2.50c, base Pittsburgh, although carloads have been sold at as high as 2.60c. On shipment out of warehouse the market continues 2.75c to 2.90c, Pittsburgh, with small lots going at as high as 3.00c.

Small Tonnages Still in Demand

Cleveland, June 12.—Demand for concrete reinforcing bars during the past week again was confined largely to amounts of 40 tons and under. No awards of any size were noted and few contracts of more than 40 tons were placed. Inquiry for small lots of bars still is in good volume. On small lots, as high as 3.36c has been paid for goods out of stock, although on amounts of 100 tons and over 2.90c has held. There is no tendency to shade these prices. On new steel bars 2.40c, base Pittsburgh is quoted Although awards in this district have been small in the past few weeks, prospective lettings are encouraging, with the 300 tons for the public library of Cleveland and the 1400 tons for the Baldwin-Fairmount reservoir as two of the largest projects under way.

Some Sellers Make Reductions

Pittsburgh, June 12.—The feature of the past week in the reinforcing bar concrete market is the award of 580 tons for the Springdale, Pa. power plant of the West Penn Power Co. This was divided evenly between the Concrete Steel Co. and the Kalman Steel So. Several sellers have reduced their active price on concrete bars out of stock to 2.50c, base Pittsburgh, although one or two still quote 2.75c. The mill price still is unchanged at 2.40c, base Pittsburgh. Some attractive tonnages of concrete bars are up for negotiation with the Pennsylvania state highway commission, one for a stretch of road at Universal, Pa., in Alleghany county taking 260 tons, which is up for closing today. Numerous small jobs requiring a carload or less have been awarded and others of similar proportion are up for bids.

Good Business at St. Louis

St. Louis, June 11.—Reinforcing bar awards in this territory have been more numerous recently and have aggregated a fair tonnage. Change in the plans of the federal reserve bank, this city, from structural steel to reinforced concrete has diverted a contract for 700 tons of bars to the Laclede Steel Co. This same maker has taken 775 tons for two other jobs. Pending business includes 1000 tons of bars for the Fourteenth street viaduct, St. Louis and 750 tons for a memorial temple, Kansas City.

CONCRETE CONTRACTS PLACED

Awards this week ..... 5,355 tons
Awards last week..... 1,735 tons
Awards two weeks ago..... 2,470 tons

800 tons, reservoir at Harrisburg, Pa., to McClintic-Marshall Co.
700 tons, Federal Reserve Bank building, St. Louis, to Laclede Steel Co.
580 tons, power plant at Springdale, Pa., for West Penn Power Co., divided evenly between Concrete Steel Co. and Kalman Co., Pittsburgh.
500 tons, United States reclamation work, to Colorado Fuel & Iron Co.
500 tons, Missouri theater apartment building, to Laclede Steel Co.
300 tons, Dolphin hotel, Miami, Fla., to Pardee Steel Corp.
475 tons, junior high school, Tulip and Ann streets, Philadelphia, to McClintic-Marshall Co.
275 tons, Loew's theater building, St. Louis, to Laclede Steel Co.
250 tons, power house, Middletown, Pa., to McClintic-Marshall Co.
250 tons, building for Lloyd Mfg. Co., Menominee, Mich., to Truscon Steel Co.
225 tons, Roosevelt hotel, Syracuse, N. Y., to Kalman Steel Co.
150 tons, high school, New Haven, Conn., to McClintic-Marshall Co.
125 tons, highway work in Wisconsin to Kalman Steel Co.
125 tons, sanitarium at Glen Lake, Minn., to Cowin & Co.
100 tons, electrical engineering building for the University of Minnesota, to C. A. P. Turner.

CONCRETE CONTRACTS PENDING

3000 tons, pier at Charleston, S. C.; Raymond Concrete Piling Co. and Duluth-Williams Co., low bidders.
1000 tons, Fourteenth street viaduct, St. Louis; pending.
750 tons, Memorial Temple, Kansas City, Mo.; pending.
500 tons, interurban terminal at Kansas City, Mo.; to be readvertised.
260 tons, road work at Universal, Pa., Allegehany county; bids all in. Tonnage to be awarded this week.
200 tons, Fisk street machine shop for the Commonwealth Edison Co., Chicago; bids in.
175 tons, building No. 6 for Underwriters Laboratories, Chicago; bids in.
150 tons, addition to Cleveland Clinic, Euclid and Ninety-third street, Cleveland; pending.
125 tons, warehouse for Eddy Paper Co., White Pigeon, Mich., bids asked.
100 tons, Lindenwood terminal of the St. Louis & San Francisco railroad at St. Louis; bids in.
100 tons, high school at Keokuk, Iowa; bids in.

Larger Deliveries

Wanted by Consumers of Tin Plate—Canners Especially Active

TIN PLATE PRICES, PAGE 1721

Pittsburgh, June 12.—Tin plate consumers each week make renewed attempts to obtain more extensive deliveries of material on order. While in one or two cases $6, per base box of 100 pounds, Pittsburgh, is the price quoted the going market is better represented by the range of $5.50 to $5.75. Although here and there tin plate consumers undoubtedly have been ordering more than they actually need at the movement so as to gain full protection on the tonnage they will require, most container manufacturers expect to fabricate every pound of tin plate that is being and will be delivered to them. Because shipments of tin plate by the American Sheet & Tin Plate Co., have been so heavy, its hot mill products for the first half year undoubtedly will exceed in tonnage those for any previous first half in its history. Its ability to operate more tin plate mills is limited by the shortage of workmen, and this condition cannot improve much during the coming two months. Due to this condition, some tonnage possibly may be carried over to October.

Scheduled to October

Youngstown, O., June 12.—District makers of tin plate have sufficient business to keep their mills scheduled until October. While the bulk of this business was taken at $5.50 per base box, Pittsburgh, some was booked at $5.75 and $6 a box. The two producers here are quoting $5.50 and $5.75, Pittsburgh, and report a good volume of business under negotiation. Tin mill black is quoted from 3.85c to 4.25c, Pittsburgh. Operation of hot tin mills is curtailed on account of an insufficient number of crews. the Trumbull Steel Co. having but 21 of its 29 units engaged, and the Falcon Steel Co. seven of nine mills under power.

Tubular Goods

Wanted in Larger Quantities—Last Half Tonnages Allocated

Pittsburgh, June 12.—Consumers of tubular goods continue their efforts to obtain larger shipments upon their goods. Deliveries are four to 12 weeks deferred, and some mills have practically allocated their output for the remainder of the year. Various jobbers are unable to balance up their stocks on merchant pipe owing to the steady drain made upon them for house and apartment buildings. Jobbers have ordered the mills to ship oil country goods, line pipe, etc., so that work in the oil fields now underway may be completed. So far the check to activities in the Oklahoma field has not brought more than one or two requests to the mills to hold up pipe tonnage and one of those arrived after the material was in transit. The buyer of 110 miles of 8 and 10-inch line pipe for California apparently is unable to locate a mill in a position to make the required delivery. Other tentative inquiries for line pipe are held up indefinitely and may not be placed this year. One buyer is calling upon the trade here offering to purchase all or any part of 22.000 tons or more of 2, 4, 6, 8, 10 and 12-inch line pipe for shipment to various oil territories but no order as yet has been accepted.

Market Continues Strong

New York, June 12.—While several municipal tonnages, recently men-

tioned are scheduled to be closed shortly, demand for cast iron pipe continues restricted. However, with pipemakers sold well into October, the tone of the market continues strong, with prices unchanged.

Buying in Small Lots

Chicago, June 12.—Cast iron pipe is being bought in small lots. This includes railroad and industrial buying and some tonnages for water supply in subdivisions. Municipal buying is quiet. Some fairly large lots of pipe are being taken by cities on the Pacific coast one lot of 3000 tons for that delivery having been booked by the United States Cast Iron Pipe & Foundry Co. The American Cast Iron Pipe Co. has taken 1500 tons at Bismarck, S. D. Bids will be opened June 15 at Woodward, Okla. on 500 tons. Figures were opened at Dayton, O., June 8, on 700 tons for county use and at Cayuga, Ind., June 11, on 175 tons. Prices are firm.

New Business Lags

Birmingham, Ala., June 11.—Cast iron pipe plants are working hard and consumers are urging delivery as fast as possible. New business is lagging. Quotations show no change. Shipments of pipe to California points, via Mobile port and through the Panama canal, continue steady. Among business placed recently was 5000 tons by Flint, Mich., to the United States Cast Iron Pipe and Foundry Co., a small award by Milwaukee and two or three small orders from Illinois.

Sheet Mills Back on 98 Per Cent Basis

Youngstown, O., June 12—While the shortage of crews held a few sheet mills in idleness one week ago, sufficient workmen reported at the beginning of this week to place the industry on a 98 per cent operating basis. The majority of sheetmakers plan to close down their mills during the first week of July for repairs. Now 115 to 117 sheet mills in this district are scheduled but with the appearance of hot weather this number likely will decrease as it did one week ago. The Youngstown Sheet & Tube Co. has 42 units engaged, the Newton Steel Co. and the Republic Iron & Steel Co. 17 each, the Trumbull Steel Co. 17, the Sharon Steel Hoop Co. nine, the Falcon Steel Co. eight, and the Mahoning Valley Steel Co. seven.

Steelworks' operation remains unchanged at 96 per cent which was established six weeks ago. Forty-nine open hearths are being charged, distributed 22 at the Youngstown Sheet & Tube Co., 14 at the Republic Iron & Steel Co., seven at the Trumbull Steel Co. and six at the Sharon Steel Hoop Co. The four bessemer converters of the Republic and Sheet & Tube companies also are blowing.

Operations of a miscellaneous character include 21 hot mills of the Trumbull Steel Co., 13 at the main works and eight at the Liberty works, eight finishing and five pipe mills at the Republic company, and ten pipe and five finishing mills and the rod and wire departments of the Sheet & Tube company. The Falcon company has seven of its nine hot tin mills engaged.

Sheet Market More Active

Orders Coming to Valley Mills in Much Larger Volume—Reduction in Price of Spelter Eases Position of Galvanized

SHEET PRICES, PAGE 1721

Pittsburgh, June 2.—Sheet producers in this district discredit reports of price concessions of $2 to $3 a ton on black and blue annealed sheets. A total of 50,000 tons of blue annealed has been offered one producer by various customers at the 3.00c, base price, but this had to be refused by the mill because deliveries could not be made within the third quarter. Some tonnage has been offered producers for shipment in October, but they are not booking that far ahead as yet. While 3.70c, base Pittsburgh, was available on black sheets in one or two instances a few weeks ago, or $3 under the going market of 3.85c, base Pittsburgh, this possibility has disappeared and the market now is firm at 3.85c. Now that the spelter market has declined to what is termed a reasonable figure around 6¾ cents, more independent sheet makers are anxious for galvanized business and prices above 5.00c have practically disappeared. A fair demand exists for all three grades.

Some independent producers, particularly in the Youngstown district, are concentrating on black sheet production, accumulating a backlog for their galvanizing departments which will run the first two weeks in July while the remaining sheet mills will close to give the workmen a vacation and to make needed repairs. So far this month no noticeable falling off is noted in automobile sheet bookings or shipments and the real effect of the usual summer slump in this grade is not expected to be felt until July. Prices of this grade are unchanged at 5.35c to 5.70c, base Pittsburgh, and reports from the Ford Chevrolet, Buick and many other medium-priced auto builders indicate only a slight falling off in the sheet consuming rate, although a tendency is manifest to hold down inventory stocks where possible.

Black Available in Six Weeks

New York, June 12.—Black sheets again can be had from some makers for specified delivery within six weeks at 3.75c, base Pittsburgh, equivalent to 4.09c, delivered, New York. The general market price, however, continues 3.85c, base Pittsburgh, or 4.19c, delivered New York. The minimum on blue annealed is 3.00c, base Pittsburgh, or 3.34c, delivered New York, and on galvanized 5.00c, base Pittsburgh, or 5.34c, delivered New York.

Business Increasing

Youngstown, O., June, 12.—Renewed activity in the sheet market generally is reported throughout the district this week with incoming mails heavier than for the past three weeks and involving orders of a pressing character. Black sheets are quoted 3.85c to 4.00c, Pittsburgh, and while business in this grade is being placed right along the tonnage is not large though sufficient to maintain fairly well balanced rolling schedules. By far the larger tonnages being purchased are in the blue annealed and galvanized grades with the former commanding 3.00c for 13 gage and heavier and 3.25c for 13 gage and lighter, and galvanized at 5.00c, Pittsburgh. The market also reflects a greater interest on the part of producers to line up business in view of a more attractive price on third quarter sheet bars. Most district sheet mills are scheduled to undergo repairs during the first week of July. Current operations are on the basis of 98 per cent of capacity although this rate varies throughout the week depending largely upon local climatic conditions.

Western Sheets Market Strong

Chicago, June 12.—Despite evidence that prices of steel sheets are being shaded by eastern producers, no such condition exists at western mills. Inland Steel Co. is out of the market for third quarter and will not sell further than that delivery. The other sheet interest is sold far ahead. Under these circumstances the market here is strong. No difficulty is experienced in covering at 3.00c, Pittsburgh, for blue annealed, 3.85c for black and 5.00c, Pittsburgh, for galvanized.

Blue Annealed Prices Firm

Philadelphia, June 12.—Sheet business continues good. Blue annealed is firm at 3.00c to 3.25c, base Pittsburgh, with considerable business at the higher figure. Galvanized is firm at 5.00c, Pittsburgh, or 5.32c, delivered Philadelphia. Black reflects occasional weakness, in that tonnage for delivery in the next two to three months is obtainable at 3.75c, Pittsburgh, or 4.07c, Philadelphia. However, the usual price of black is 3.85c, at Pittsburgh, or 4.17c, at Philadelphia.

Strip Needs Maintained

STRIP PRICES, PAGE 1721

Pittsburgh, June 12.—Larger makers in this territory report their customers have placed contracts covering needs for the third quarter in both hot and cold-rolled strips and in view of the fact that this coverage has been at the same or an increased rate over the second quarter consumption, they generally are greatly encouraged over the outlook. Only limited tonnage therefore is left available for transient buyers and on this the regular prices of 3.30c on hot and 5.35c on cold are quoted. It is understood that certain cold rolled strip steel customers of the hot strip mills can purchase hot rolled strips at 3.15c, largely in the narrow sizes but the regular market is 3.30c. In one extreme case 3.05c was reported. The demand at present is about evenly divided between the two grades. Deliveries of hot strips are from 6 to 12 weeks deferred while in cold they are somewhat easier. Certain sizes are being available in three to four weeks while others cannot be had inside of eight to 12 weeks.

Shape Buying Is Lighter

Majority of Projects Involves Relatively Small Tonnages—Tendency of Buyers Is To Hold Off—Inquiries Better

STRUCTURAL SHAPE PRICES, PAGE 1721

New York, June 12.—An improvement is noted in structural demand, more than 10,000 tons of fresh inquiry being reported in this city alone. Of this total, however, 4500 tons are for the New York approach of the vehicular tunnel under the Hudson river. The total structural requirements of this project will probably not run more than 10,000 tons. Awards locally continue rather light, although considering the district as a whole, a fair volume of business has been placed. While shape deliveries are a trifle easier, it is still virtually out of the question to obtain a sizable tonnage of assorted specifications much under two months; in fact, two to three months is the rule. The market remains steady at 2.50c, Pittsburgh.

Premiums for early shapes are less freely obtainable and those eastern mills which have been specializing in this sort of business now will come close to meeting the quotations of the largest producer.

Buyers Continue to Hold Off

Cleveland, June 12.—Structural shape buyers continue to delay purchases in hopes of a weakening in the price situation although such a tendency to weakness is not discernible. The postponement of building operations until more favorable deliveries are assured has caused the lull in buying to be continued. Building costs also are an important factor in new demand and many projects have been refigured recently to effect economies. Some of these which are still pending are the Keith's theater building, Akron, O., originally designed for 580 tons, Home Savings Bank, Toledo, O., reduced from 500 to 200 tons on redesigning, and Knights of Columbus building, Rochester, N. Y., reduced from 2300 to 1800 tons. Inquiry on small tonnages continues active, with few large projects being brought up for figures. Prices on plain structural material hold strong at 2.50c to 2.60c, base Pittsburgh.

Building Keeps Up Well

Chicago, June 12.—While structural demand for industrial and business buildings is somewhat curtailed, the market is being supported by highway and railway bridges and numerous other semipublic projects. Placing of 24,700 tons for a pipe line and penstocks for the Hetch Hetchy project at San Francisco gives an unusually large plate tonnage. Among contracts placed recently most are for highway and railroad bridges. Plain material continues to be quoted at 2.60c, Chicago mill, for delivery at convenience, while some tonnages have been placed recently at 2.70c for third quarter delivery.

Light Work Holds Up

Boston, June 12.—While the market has been free from heavy tonnage awards during the past week fabricating shops in eastern New England report an improved run of small jobs, and conditions seem hopeful for a continued healthy activity throughout the year. In the Boston district there are at least four large jobs pending which are expected to be closed in the early fall. Mill prices have softened slightly in some of the recent contracts. Plates are down to 2.50c and shapes while held at 2.50c by the principal interests are selling in some cases at 2.45c, Pittsburgh.

More Cheerful Feeling Reflected

Philadephia, June 12.—While incoming structural shape business is not replacing shipments which continue at a heavy rate, new demand continues fair, in fact a more cheerful feeling has replaced the pessimism prevailing recently. Several new structural jobs are being talked about. It is expected that early announcement will be made of plans for replacing the large train shed of the Pennsylvania railroad which burned here yesterday. This structure involved upwards of 3000 tons, most of which must be scrapped. The Pennsylvania railroad may build an umbrella shed. Although bids will be opened the latter part of June for the first section of the Arch street subway, Philadelphia, little new steel will be required. This is a postponed job, McClintic-Marshall Co., having fabricated the steel four years ago. Since that time it has been in storage at North Philadelphia. Among the new structural projects mentioned is a 20-story hotel at Broad and Spruce streets Philadelphia, but this is still in the preliminary stage The price on plain shapes continues at 2.50c, base Pittsburgh, or 2.82c, Philadelphia on everything attractive, although small lots continue in some cases to bring somewhat higher.

More Buying After Delay

Pittsburgh, June 12.—Buyers of structural shapes in many directions are realizing the futility of waiting for lower prices on steel and accordingly are entering their requirements at the 2.50c base, Pittsburgh, price. Deliveries are much deferred and while there has been some holding up of building programs as well as some postponment of closing contracts, it is on the account of high labor costs more than anything else. Locally, awards are of relatively unimportant tonnages but local fabricators operating at not above 80 per cent on account of reduced labor forces still go far afield for the majority of their orders. As an example the Fort Pitt Bridge Works, Pittsburgh, was awarded the power plant at East St. Louis, Ill., requiring 3100 tons. Fabricators here are interested in the Cleveland public library tonnage of 2200 tons, nearing the closing date. The First National Bank building, Huntington, W. Va., involving 600 tons, is indefinitely postponed. Possessed of well balanced order books, fabricating order shops cannot make delivery this side of five or six months on work involving considerable fabrication; a simple job might be delivered in four or five months.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 12,379 tons
Building awards last week ..... 10,275 tons
Building awards two weeks ago.... 7,442 tons

16,700 tons, bay crossing pipe line of the Hetch Hetchy aqueduct, San Francisco, to Kellogg Mfg. Co., New York.
8000 tons, steel penstocks for the Moccasin Creek power plant, Hetch Hetchy project, to Western Pipe & Steel Co., Oakland, Cal.
3100 tons, power plant addition for the United States Electric Light & Power Co., East St. Louis, Ill., to Fort Pitt Bridge Works.
1200 tons, bridge work for Big Four railroad, to McClintic-Marshall Co.
1000 tons, Loew theater building, to Mississippi Valley Structural Steel Co., St. Louis.
800 tons, School No. 177, New York, to Easton Structural Steel Co.
700 tons, Carver street power station for the Edison Electric Co., Boston, to Levering & Garrigues.
636 tons, highway bridges in Sacramento county, California, to Moore Shipbuilding Co.
503 tons, manufacturing building for Otis Elevator Co., Quincy, Ill., to Kenwood Bridge Co.
500 tons, substation for the New York Edison Co., Park Place, New York, to Hay Foundry & Iron Works.
500 tons, parochial school, Brooklyn, N. Y., to Hinkle Iron Co.
400 tons, Oliver high school, Pittsburgh, to John Eichleay Jr. Co.
340 tons, power station at Pineville, Ky., to Virginia Bridge & Iron Co.
300 tons, train runway for National Car & Foundry Co., St. Louis, to Mississippi Valley Structural Steel Co.
300 tons, office building, Jamaica, L. I., to Hay Foundry & Iron Works.
250 tons, bridgework, Baltimore & Ohio railroad to Fort Pitt Bridge Works.
235 tons, Wabash railroad bridge near Gilmore, Mo., to American Bridge Co.
200 tons, apartment, Flatbush avenue, Brooklyn, to Hay Foundry & Iron Works.
200 tons, riveting tower for Baldwin Locomotive Works, Eddystone, Pa., to Shoemaker Bridge Co.
197 tons, Missouri Pacific railroad bridge material to Virginia Bridge & Iron Co.
175 tons, highway bridges, Waukon, Iowa; fabricator not known.
160 tons, bridge for Transit commission, Brooklyn, N. Y., to Phoenix Bridge Co.
160 tons, interurban passenger station, Kansas City, Mo.; fabricator not known.
150 tons, office building Fifty-seventh street, New York, to Hay Foundry & Iron Works.
148 tons, highway bridge, La Grande, Oreg., to Illinois Steel Bridge Co.
125 tons, addition to plant of Mann Bros., Buffalo, to Kellogg Structural Steel Co.
100 tons, column cores, telephone exchange, Lawrence, Mass., to Levering & Garrigues.

STRUCTURAL CONTRACTS PENDING

4500 tons, approaches on New York side of New York-New Jersey vehicular tunnel, New York, bids asked.
1800 tons, 5-story building for Knights of Columbus, Rochester, N. Y.; probably will be refigured 12-story plans requiring 2300 tons abandoned.
1600 tons, school No. 47, New York; bids asked.
1000 tons, hotel, Sixth avenue and Fifty-eighth street, New York; pending.
1000 tons, Jamestown hotel, Jamestown, N. Y.; bid closing date extended from June 11 to June 18.
1000 tons, junior high school, Schenectady, N. Y.; bids asked.
900 tons, Margoli apartment hotel, 11 West Forty-seventh street, New York. Specifications out soon.
880 tons for bridges and towers for Chicago, Burlington & Quincy railroad; bids in.
800 tons, office building, Seventh avenue and Fifty-second street, New York; bids asked.
700 tons, school No. 60, New York; bids asked.
600 tons, First National Bank building, Huntington, W. Va.; bids all in. Project indefinitely postponed.
580 tons, Keith theater building, Akron, O.; bids in June 13 on revised plans.
550 tons, 2-story addition for Champion Coated Paper Co., Hamilton, O.; bids in.
500 tons, school No. 152, New York, pending. General contract awarded to Willis Construction Co.
500 tons, loft building, 107 West Thirty-eighth street, New York; bids asked.
500 tons, press building for The World, New York; bids asked.

420 tons, additional, school No. 36, New York; pending. General contract awarded to Willis Construction Co.
400 tons, loft building, 24 West Forty-seventh street, New York. Sommerfeld & Steckler, architects. Specifications out soon.
400 tons, school No. 73, New York; bids asked.
400 tons, school No. 71, New York; bids asked.
325 tons, railroad shops for St. Louis & San Francisco railroad, Lindenwood, Mo.; bids in.
200 tons, Home Savings bank, Toledo, O., to be awarded this week.
200 tons, two subways for Illinois Central railroad, Champaign, Ill.; bids asked.
200 tons, building for United States Metals & Refining Co., Cartaret, N. J.; bids asked.
200 tons, loft building, Eighty-eighth street, New York; bids asked.
188 tons, bridges for Chicago, Milwaukee & St. Paul railroad; bids in.
130 tons, bridge work for Louisville & Nashville railroad at Louisville, Ky.; pending.
Several hundred tons, hotel for Seagate Hotel & Bath Corp., Coney Island, specifications out soon.

Acquires Boiler Plant

The Kensington-Davis Corp. with Roy E. Lynd, president, T. B. Davis, vice president, and F. C. Slee, secretary, has taken over the business formerly conducted by W. A. Case & Sons, 144 Kensington Avenue, Buffalo. The new company is capitalized at $250,000 and will manufacture low pressure steam and hot water boilers on an extensive scale. The present foundry building is 90 x 145 feet with a daily capacity on the company's regular line of work of about 10 tons. An additional foundry will be built at once with a floor area of 140 x 200 feet. This is expected to bring the capacity to from 35 to 40 tons daily.

Imports Are Listed

Philadelphia, June 12.—Imports arriving here during the week ending June 9 were as follows: Iron ore from Sweden, 14,161 tons; iron ore from Algeria, 6201 tons; scrap brass from Montreal, 125 tons; scrap steel from England, 50 tons; ferromanganese from England, 355 tons, and manganese ore from West Africa, 7441 tons.

Officers Are Elected

H. B. Smith Co., Westfield, Mass., at its annual meeting held June 6, elected the following officers for the ensuing year: President, William T. Smith; vice president, William B. Reed; treasurer, Philip C. Smith; assistant treasurer, Edwin W. Smith; directors, the officers and Philip C. Smith, Jr., Long Island, N. Y., E. B. Chapin, Andover, Mass., James M. Smith, Providence, R. I., and C. K. Prince. The company has no further expansion plans in so far as new building is concerned other than that which has been started at the north side in the construction of an additional foundry building. The usual dividend was declared.

As Kerchner & Marshall, 647 Oliver building, Pittsburgh, L. S. Kerchner and R. M. Marshall have been appointed sales agent by the receiver for the American Manganese Mfg. Co., Dunbar, Pa., in the sale of pig iron, ferromanganese, spiegeleisen, coal, coke, sand, etc. in the western territory. The furnace was blown in on foundry iron May 14 but the production of spiegeleisen is contemplated at an early date.

Many Rails Are Placed

New York Central Closes 150,000 Tons and Other Lines About 90,000 Tons—Track Fastenings Being Bought in Large Lots

RAILROAD TRACK MATERIAL PRICES, PAGE 1721

New York, June 12.—The New York Central railroad during the past week placed orders for 150,000 tons of rails for last half delivery. This business was distributed as follows: Bethlehem Steel Co., 67,500 tons; Illinois Steel Co., 57,100 tons; Carnegie Steel Co., 13,350 tons; Inland Steel Co., 12,050 tons. The railroad has taken options for an additional 25,000 tons to be distributed in the same ratio. The Southern Pacific railroad has placed an additional 13,000 tons of rails with the Tennessee Coal, Iron & Railroad Co. The Pennsylvania railroad has placed 15,000 tons of rails for the last half, of which 10,000 will be rolled by the Carnegie Steel Co., and 5000 tons by the Bethlehem Steel Co. The Philadelphia & Reading railroad has placed some tonnage but the figures have not been announced. Some of the other eastern roads have tonnages under negotiation which are expected to be placed within the next week or two.

Although far from brisk, car demand is showing some improvement, with orders small. Locomotive buying is confined largely to one switch engine for the Magnolia Petroleum Co., Dallas, Tex., one locomotive for the Central Natvidad, Cuba, and one for the Central Jaronu, Cuba, this business all going to the Baldwin Locomotive Works.

Orders For Small Quantities

Pittsburgh, June 12.—As always, the light rail market is barometric of coal mining activities and, while a steady inflow of light rail orders is noted, it is not as large as it should be at ths season of the year due to the slowed-up actvity among the mines. Several orders are being received daily but the majority of these are for single carloads. The price is unchanged at 2.25c, base Pittsburgh.

Track accessories for third quarter needs of valley railroads, including the Pennsylvania; Buffalo, Rochester & Pittsburgh; and others are up for negotiation. In track bolts no tonnages are specified and while 4.25c is the active price on most inquiries on standard bolts, concessions to 4.00c are offered on large quantities. Up to 5.50c is asked for ⅝-inch bolts. In tie plates what business is now being accepted cannot be delivered before September due to the filled-up condition of the order books. Hence, third quarter delivery is well along despite the fact that many of the larger requirements for that period are yet to be placed. Spikes can be delivered somewhat before September. Present inquiries are mostly for tie plates and spikes for delivery as soon as possible. Prices appear to be somewhat stablilized, makers and users alike being satisfied with 3.15c on standard spikes, 3.50c to 3.75c on boat and barge spikes, 3.75c on small railroad spikes and 2.60c to 2.75c on tie plates, depending upon the extent of fabrication.

Railroad Buying Strong Factor

Chicago, June 12.—Railroads give every promise of continuing their buying of iron and steel, either directly for their own use or through car builders for new rolling stock. This class of buying has been one of the strongest supports of the steel market through the present year and no sign is seen of its growing less. Coincident with the formal distribution of 150,000 tons of standard steel rails by the New York Central railroad, about 60,000 tons of rails have been booked by Chicago mills for four or five western railroads. These rails are for delivery this year if rail mills are able to roll them during that period.

Car inquiry and buying are at a low ebb and the number figuring in current transactions is small. One builder of steel tanks is asking protection from mills on steel for 150 tank cars for a western oil company, whose name is not divulged. Track fastenings are in somewhat less demand than was the case earlier in the year, as this usually is a dull season but an aggregate of at least 20,000 tons of the plates are on inquiry. There is also a fair demand for spikes and plates. Light rails are dull.

Tie Plates Are Wanted

Cleveland, June 12.—An inquiry for 100,000 tie plates from the Wheeling & Lake Erie railroad is under negotiation. The Clover Leaf has taken no action on a recent inquiry for 4000 tons of rails and may not place this tonnage at this time. The Pittsburgh & Bessemer Coal Co. is inquiring for 100 to 200 coal cars requiring 900 to 1800 tons of steel.

CAR ORDERS PLACED

Utah Copper Co., six cabooses and four work cars, to Magor Car Corp.
Chino Copper Co., 20 dump cars, to National Steel Car Corp.
Chicago, Burlington & Quincy, 600 coal cars, to Pullman Co.
West India Sugar Finance Corp., 160 cane cars, to Magor Car Corp.
Western Maryland railroad, rebuilding of 2000 hopper cars, work to be done in own shops.
Chicago & Eastern Illinois railroad, two diners to Pullman Co.
Phelps, Dodge & Co., 66 hoppers to the Mt. Vernon Car & Mfg. Co.

CAR ORDERS PENDING

South African railways, and not South American railways, as reported in last week's issue, 500 grain cars, bids asked.
Knickerbocker Fuel Co., New York City, 200 gondolas, bids asked.
Shell Oil Co., 150 tank cars; bids pending.
Chicago, Milwaukee & St. Paul railroad, 500 steel underframes; bids asked.
Pittsburgh & Bessemer Coal Co., 100 to 200 coal cars; bids being taken.

To Rebuild Plant

Officials of the Ohio Cutlery Co., Massillon, O., have announced that a lease has been secured on a building and as soon as machinery can be installed operation will start. The plant of this company was destroyed by fire recently. At a recent meeting of the board of directors the directorate was increased from five to seven members. The new directors are Ralph Linton, superintendent of the company since its organization, and W. O. Custer.

The Nonferrous Metals

Copper Firmer but Metal Markets in General Still Quiet Though Consumption Is Heavy

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
June 6....	15.00	15.25	41.87½	7.30	6.35	26.00	6.85	29.00
June 7....	15.00	15.25	42.37½	7.30	6.30	26.00	6.80	29.00
June 8....	15.00	15.25	42.25	7.30	6.25	26.00	6.75	29.00
June 11....	15.00	15.25	42.00	7.30	6.20	26.00	6.75	29.00
June 12....	15.00	15.25	42.12½	7.30	6.15	26.00	6.75	29.00

†Outside market quotation.

NEW YORK, June 12.—Mixed currents again prevailed in the nonferrous metal markets this week. Copper maintained its improvement at 15c, following sales at 14.75c, delivered, the previous week. Zinc, however, declined steadily, at the rate of five points a day. Tin fluctuated within rather narrow limits. Lead eased slightly. Antimony was weak. Aluminum was firm. A somewhat better sentiment has been manifest in most of the metal industries, excepting zinc, where overproduction has become a problem. The Ruhr situation has continued an important factor in the world metal markets, having definite bearing on our markets, and negotiations toward a settlement continue to be watched keenly.

A good volume of copper business was done the past week for foreign and domestic account. On June 6 sales for export reached 2000 tons, German consumers buying direct from American exporters for the first time in a considerable period. China also has inquired for 2000 to 3000 tons of electrolytic and furnace refined copper, buying only small tonnages, however. The domestic price has been 15c, delivered, for prompt and third quarter deliveries; the export price, 15.12½c, f.a.s. New York. Casting copper is selling at 14.75c, refinery. Lake is held at 15.25c, delivered.

Zinc prices have eased with a declining statistical position to 6.15c, East St. Louis, as of June 11. Loss of our export market, due to European conditions, has left the smelters with a smaller outlet than they expected, so that production is becoming rather larger than shipments. Prices have dropped about 2 cents a pound since the high of March 20. Demand has been light and mostly for early requirements. High grade zinc prices have ranged between 8.25c and 9c, delivered.

Lead prices have eased off in a quiet market, on pressure by a small western factor. In some cases 7c, East St. Louis, has been shaded by cutting of the delivered price in C. F. A. territory. Production of pig lead this month is being reduced somewhat, due to the fact some smelters have exhausted their stocks of ore and henceforth are limited by mine output.

Tin prices have ranged between 41.50c and 42.50c, with little interest. Expectation of reduced American deliveries during the summer months, possibility of large Straits shipments this month and continued subnormal European consumption are causing market factors to exercise caution. Consumers have been buying lightly though demand for plate is heavy.

Antimony declined to 6.75c, duty paid, for spot wholesale lots; 4.75c, c.i.f. in bond, for metal afloat; 4.80c to 4.85c for shipment from the Orient.

Aluminum of foreign origin again is being offered here by a leading importer, the first in some months. Prices of 98 to 99 per cent virgin ingot aluminum in the outside market are irregular, but this grade can be purchased at around 26c; 99 per cent is scarce, at 27.50c. Scrap prices have recovered strength.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 24 oz., min.	24.25
High brass	20.50
Zinc, ga. 9 to 18 (plates ½c less)	9.20
Lead, full sheets (cut ¼c more)	10.75
Aluminum, base 18 ga. and up...	35.40
SEAMLESS TUBES	
High brass	25.50
Copper	27.00
RODS	
High brass, round, ⅜ to 2½ inch	18.75
Naval brass rod	21.00
WIRE	
Copper	18.00 to 18.25
High brass	22.25

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.50 to 10.00
New York	9.25 to 9.50
Chicago	9.50
HEAVY YELLOW BRASS	
New York	6.50 to 7.00
Chicago	7.00
Cleveland	6.50 to 7.00
ZINC	
New York	4.25
Cleveland	3.00 to 3.50
HEAVY COPPER AND WIRE	
Cleveland	11.50 to 12.00
New York	11.50 to 12.00
Chicago	12.00
RED BRASS TURNINGS	
New York	8.75 to 9.00
Cleveland	8.50 to 9.00
Chicago	9.00
YELLOW BRASS TUBING	
Cleveland	6.50 to 7.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	7.00 to 7.25
Chicago	7.00
ALUMINUM BORINGS	
Cleveland	11.00 to 12.00

Affairs of the Badger Metal Ware Co., Milwaukee, are being brought to a clear working basis by the recent decision of Federal Judge Geiger to the effect the company is insolvent. Recently officers of the company applied for a receivership in the Wisconsin state courts, claiming it was financially sound but desired to prevent action by creditors which might result in bankruptcy. Creditors then brought involuntary bankruptcy proceedings in federal court.

Unfilled Orders Again Show Decrease

Unfilled bookings of the United States Steel Corp. on May 31 amounted to 6,981,351 tons, a decline of 307,158 tons. This is a reduction of 4.21 per cent, the largest percentage decline since October 31, 1921, when the reduction was 6.004 per cent. The total of unfilled bookings is the smallest this year, with the exception of that on Jan. 31, when 6,910,776 tons was reported. Further comparisons follow:

Date	Total	Change, tonnage	Change, per cent
May 31, 1923....	6,981,351	307,158—	4.21 —
Apr. 30, 1923....	7,288,509	114,823—	1.5 —
Mar. 31, 1923....	7,403,332	119,343+	1.63 +
Feb. 28, 1923....	7,283,989	373,213+	5.40 +
Jan. 31, 1923....	6,910,776	165,073+	2.31 +
Dec. 31, 1922....	6,745,703	94,539—	1.39 —
Nov. 30, 1922....	6,840,242	62,045—	.89 —
Oct. 31, 1922....	6,902,287	210,680+	3.14 +
Sept. 30, 1922....	6,691,607	741,502+	12.4 +
Aug. 31, 1922....	5,950,105	173,944+	3.01 +
July 31, 1922....	5,776,161	140,630+	2.48 +
June 30, 1922....	5,635,531	381,303+	7.2 +
May 31, 1922....	5,254,228	157,311+	3.08 +
April 30, 1922....	5,096,917	602,769+	13.4 +
Mar. 31, 1922....	4,494,148	353,079+	8.5 +
Feb. 28, 1922....	4,141,069	100,609—	2.307 —
Jan. 31, 1922....	4,241,678	26,736—	0.0062—
Dec. 31, 1921....	4,268,414	17,872+	0.004 +
Nov. 30, 1921....	4,250,542	36,287—	0.84 —
Oct. 31, 1921....	4,286,829	273,841—	6.004 —
Sept. 30, 1921....	4,560,670	28,744+	0.63 +
Aug. 31, 1921....	4,531,926	298,398—	6.3 —
July 31, 1921....	4,830,324	287,544—	5.59 —
June 30, 1921....	5,117,868	364,619—	6.2 —
May 31, 1921....	5,482,487	362,737—	6.2 —
April 30, 1921....	5,845,224	439,541—	6.8 —
Mar. 31, 1921....	6,284,765	649,102—	10.32 —
Feb. 28, 1921....	6,933,867	639,297—	8.21 —
Jan. 31, 1921....	7,573,164	574,958—	7.59 —

British Prices Are Rising

London, June 2.—According to quotations compiled from customs manifests by the board of trade for April, export prices in Great Britain are rising on the whole although the prices for billets and plates are slightly lower.

The average export prices for April are stated to be as follows:

	Per Gross Ton	
Foundry pig iron	£ 5 13 7	$26.10
Ferromanganese	13 5 4	61.25
Carbon billets	10 3 7	46.80
Beams	9 18 8	45.80
Plates	10 17 6	49.00
Galvanized sheets	20 9 9	94.50
Tin plate	21 12 0	100.00

Operating at 90 Per Cent

Chicago, June 12.—A high level of mill operation continues at Chicago with all the steelworks stacks of the Illinois Steel Co. producing pig iron, while finished material is being made well in excess of 90 per cent of mill capacity. Inland Steel Co. continues at its rate of 75 to 80 per cent of capacity.

The Mitchell Motors Co., Inc., Racine, Wis., recently was involved in bankruptcy proceedings. Its assets include: Finished and unfinished automobiles, $1,617,598; real estate, $980,986; and machinery, $985,558. Future plans of the company are not known.

Scrap Activity on Decline

(*Concluded from Page* 1722)

Continued dullness in demand is the principal contributing factor, although some dealers are maintaining their policy of being practically out of the market.

Buying Is Restricted

Philadelphia, June 12.—Scrap buying during the past week has been restricted to moderate lots aggregating a small total. Prices on some grades have eased off further, however, a better feeling prevails on scrap due particularly to the fact that yard stocks are small. The trade is inclined to believe the market will not go much lower than the present level and regards the prospects for an advance by August as good.

Price Decline Is Slower

Pittsburgh, June 12.—Decline in scrap prices is at a slower gait and is not so general although two or three grades are 50 cents lower, starting with heavy melting steel at $20.50 to $21. While the steel on recent railroad lists brought around $22.50 and no mill has paid less than $22 recently, yard dealers are paying around $20.50 for heavy melting steel for their yard stocks, which makes the market on that grade. It is impossible to obtain more than $17 to $17.50 for machine shop turnings and heavy breakable cast cannot be quoted at above $19 to $19.50. Consumers generally from Massillon, Canton, Warren, Cleveland, Youngstown, and other points in Ohio, eastward to Weirton, W. Va., are holding up tonnages; Monessen, Pa., still is embargoed and large local consumers are taking but three or four carloads daily instead of eight to 10 carloads. The specialties on recent railroad lists brought around $23.50; the steel wheels around $23 and the rails $19 to $20. Sellers of scrap generally expect a quiet month or two ahead, with prices generally remaining at about their present basis.

Scrap Falls Off $1 More

Detroit, June 12.—The iron and steel scrap market suffered another reduction in the past week, prices falling off $1 a ton on most grades. Consumers are taking in some material, but it is generally on old contracts. The material now being purchased is light and consists mostly of better grades. Malleable continues to hold its high place owing to its scarcity. The tone of the market is extremely weak. Producers are disinclined to sell scrap around present quotations, many believing that a better tone will develop within the next 30 days.

Further Weakness Is Shown

Cincinnati, June 12.—Although there are few reductions, the local iron and steel scrap market is weaker than last week. There is little buying and practically no inquiry. Dealers are of the opinion that the bottom of the present downward movement is not far distant. A further drop of $1 is shown in heavy melting steel. Bundled sheet scrap also dropped 50 cents. Aside from these reductions there were no other material changes in the situation. About the only activity noted is where dealers have contracts expiring and are anxious to get the material to deliver before expiration dates. More favorable weather has enabled railroads to handle their scrap and offerings from that source are large. The Norfolk & Western railroad will be closing in a few days with a list aggregating 30,000 tons, while the Chesapeake & Ohio has submitted a list involving 7000 to 8000 tons.

Court Bars Collection of Price Data

Washington, June 12.—The Supreme court's decision in the linseed oil case, condemning open price associations as violations of the Sherman act, is taken by the departments of commerce and justice and the federal trade commission to emphasize their stand that trade associations get into the twilight zone when they begin collecting and disseminating price data. Secretary Hoover is withholding comment on the decision on the ground he prefers not to discuss a Supreme court decision but he states the linseed oil decision does not affect the unofficial limitations placed upon trade association activities by him and Attorney General Daughtery in correspondence one year ago.

In the linseed oil industry a bureau was set up for clearing not only information concerning cost accounting, freight rates ways and means for broadening the market but also full reports on sales, quotations, production and similar market essentials. The obvious policy, the court found, was to substitute "intelligent" competition for open competition and the inevitable outcome a suppression of competition and restraint of trade, which the court found contrary to the antitrust laws in the hardwood decision.

Within the government itself the necessity for collecting trade data is conceded, and one result of the decision will probably be a broadening of the work of the census bureau in compiling production statistics. The twin bills of Senator Edge, of New Jersey, calling for an investigation of trade associations and their regulation, are expected to be revived next December. The legitimate functions of trade associations, such as the furthering of cost accounting, are not restricted by the linseed oil decision, but the collection of substantially all classes of market information and its limited distribution may be said to be proscribed.

The warehouse industry of San Francisco involving the handling and storage of the major portion of the nonperishable food supplies that pass through the city, has adopted the American plan of employment, according to an announcement of the San Francisco Industrial Association.

Forging Plant To Be Built at Champaign, Ill.

The plant of the Clifford-Jacobs Forging Co, Urbana, Ill., which was destroyed by fire on March 27 will move to Champaign, Ill., three miles west of their present location, sometime during the month of July. Until the new plant is ready however, the company will continue its business of contract drop forging in temporary quarters at the old site.

The partnership which has been in existence for the past four years has been terminated and the business acquired and passed to Clifford-Jacobs Forging Co., a corporation with main offices and plant at Champaign. W. E. C. Clifford has been elected president; D. B. Jacobs, vice president and general manager; H. S. Capron, secretary-treasurer.

The new plant will represent an investment of $350,000. The buildings are of steel and concrete construction throughout and will house nine steam drop hammers and three board drop hammers ranging in weight from 3000 pounds to 6000 pounds with other collateral equipment to take care of the range of work for this hammer equipment.

The control and management of the new corporation will remain with Mr. Clifford and Mr. Jacobs. Mr. Clifford has been a resident of Champaign all his life. He was treasurer of the state of Illinois for two years and when the United States entered the late war was commissioned as captain in the army and served 18 months.

Vice president Jacobs has spent the major portion of his life in the drop forge business. At various times, he has served as superintendent of Atlas Drop Forge Co., Lansing, Mich., and Michigan Drop Forge Co, Lansing, Mich.; James McKay Co., Pittsburgh, and A. O. Smith Co., Milwaukee.

The present line of work is confined mostly to railway and tractor forgings.

Living Cost Varies

Washington, June 12.—From April 15 to May 15 the cost of living increased in 15 out of 22 cities surveyed by the bureau of labor statistics of the department of labor, decreased in five and was unchanged in two. For the period May 15, 1922, to May 15, 1923, all but one of these 22 cities reported increased costs. Comparing the average cost for 1913 with the May 15 cost-of-living data the increase for May 15 was as high as 53 per cent in certain cities for which reports are obtained.

Foreign Grip

On Latin American Markets Declared Broken—Outlook Hopeful

American capital, ingenuity and engineering skill have broken Europe's grip on the markets of Latin America, according to Dr. Julius Klein, director of the bureau of foreign and domestic commerce, department of commerce, Washington, in an address before the recent meeting of the National Foreign Trade council recently in New Orleans.

Shortly after the armistice, the lowered cost of production in Europe threatened seriously to regain for European manufacturers the Latin American markets to which the United States naturally had fallen heir during the period of the war. Every weapon of commerce known to the centuries-experienced merchants of the Old World was employed to support this advantage. Salesmen's propaganda was broadcasted from thousands of trained tongues, promising prices, deliveries, and qualities which seemed certain to banish the American and his goods from the southern avenues of trade.

The vigoruous onslaught did for a time seriously affect American trade relations. Some of the smaller American houses were even forced to close their doors. Now, however, the tide has turned. Throughout Latin America, with the single exception of Mexico, exports from the United States for the last quarter of 1922 showed an increase, and in some cases, a material increase, over those of the corresponding period of 1921.

The outlook for the near and distant future from an American sales standpoint is selling her staple products in the world's markets at increasingly satisfactory prices, is more hopeful. Latin America is thriving and the United States is certain to enjoy more than a fair share of this revival of trade.

The part which American capital, engineering skill, and business ability have played in the development of the natural resources of Latin America is not so well recognized as it should be, according to Dr. Klein.

Credit for a large share of the present success in overcoming European competition is due to the judicious investment of American capital in that region and to the pioneer work of American engineers. Long before the United States was in a position to export capital, its citizens were applying their skill and ingenuity in building railroads, establishing steamship lines, in opening coal and other mines and similar extension work in South America.

Dr. Klein contended that in forecasting our Latin American trade, the importance of our financial transactions with the southern continent must be given special consideration. These transactions now amount to from $2,500,000,000 to $3,000,000,000. After the armistice ,as a natural consequence of its newly acquired position as a creditor nation, the United States took the place of Great Britain, France and other European countries as the chief market for Latin American loans. These flotations reached their height in the first half of last year when a total of about $15,000,000 was issued.

Continue Coal Research

Continuation of the coal-mine research at Carnegie Institute of Technology, Pittsburgh in the coming year will be carried on by six instead of four research fellows as previously. The purpose of the fellowship staff is the solution of problems in mining and utilization of fuels which are of special importance of the bituminous coal industry.

The following subjects are among those suggested for investigation during the coming year; geology, correlation of coal seams by microscopic characteristics, microscopic study of the coking constitutents of coal; acid mine waters, selection and performance of equipment for handling acid mine water, action of acid mine water on concrete and protective coatings; coal mining, methods of increasing the percentage of lump coal, a study of possible substitutes for wood in mine timbering; coal washing, wet and dry methods, utilization and disposal of washery waste; utilization of coal, smithing qualities of coal, determination of the comparative rate of carbonization of gas coals; safety and efficiency; coal storage, laboratory tests of relative tendency of coals to fire spontaneously, effects of size on deterioration in storage, maximum safe storage temperature, and mine explosions.

Announce New Department

A new department which will handle the design of line insulators and other work which may be assigned to it from time to time in connection with transmission problems, has been announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. This department will be known as the "porcelain insulator and transmission engineering department." and wll be under the direction of C. L. Fortescue, who has been appointed manager. Rapid growth in the porcelain business and the steady increase in the number of problems growing out of the transmissions of high voltages for great distances necessitated the creation of a department to handle these problems. The department will not be concerned with the design of large transmission systems.

New Officers

Nominated By American Society Of Mechanical Engineers

The report of the nominating committee of the American Society of Mechanical Engineers, which was presented following the conferences held at the spring meeting at Montreal last week, names nominees for the principal officers of the society for the coming year, and delegates to the American Engineering council.

Fred R. Low, editor, *Power*, New York, is nominated for president. Other nominations are as follows: Vice Presidents; George I. Rockwood, President and treasurer, Rockwood Sprinkler Co., Worcester, Mass.; M. L. Cooke, consulting engineer in management, Philadelphia; and W. J. Sando, consulting engineer, Milwaukee. Managers: E. O. Eastwood, professor of mechancial engineering, University of Washington, Seattle, Wash.; F. A. Scott, president, Warner & Swasey Co., Cleveland; and E. R. Fish, vice president, Heine Boiler Co., St. Louis. Treasurer: W. H. Wiley, president, John Wiley & Sons, Inc., New York.

Delegates to the American Engineering council were nominated as follows: Dexter S. Kimball, dean of the college of engineering, Cornell university, Ithaca, N. Y.; William Schwanhausser, chief engineer, Worthington Pump & Machinery Corp., New York; S. W. Stratton, president, Massachusetts Institute of Technology, Boston; P. F. Walker, dean of the school of engineering, University of Kansas, Lawrence, Kan.; F. K. Copeland, president, Sullivan Machinery Co., Chicago; J. T. Faig, president Ohio Mechanics institute, Cincinnati; R. E. Flanders, manager, Jones & Lamson Machine Co., Springfield; C. C. Thomas, Dwight P. Robinson & Co., Inc., Los Angeles, Calif.; W. B. Powell, treasurer, Industrial Planning Corp., Buffalo.

In case vacancies occur previous to election, the following alternates will serve as nominees: Vice president, Paul Doty, St. Paul; manager, William Schwanhausser, New York; delegates to the American Engineering Council, R. Sanford Riley, Worcester, Mass.; W. L. DeBaufre, Lincoln, Neb., and C. N. Lauer, Philadelphia. Charles L. Newcomb is chairman of the nominating committee.

A. F. Strafer has been appointed sales manager of the Industrial Plants Corp., 25 Church street, New York. Mr. Strafer formerly was general manager of the Graves Machinery Exchange.

European Markets Remain Weak

Few Sales of Iron and Steel, though There Is No German Competition—70 Per Cent of Ruhr By-Product Ovens Cold—English Coke Higher, but French Refuse to Purchase American

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, June 11.—Despite the fact that there is virtually no German competition, European iron and steel markets remain weak. British and French pig iron prices have been lowered still further, but there are few sales. In the Ruhr, notably at the Union works, Dortmund, several blast furnaces were allowed to freeze solid during the recent communist riots, restricting production. About 70 per cent of the Ruhr by-product ovens are cold.

The French correspondent of IRON TRADE REVIEW reports from Paris that English coke has been offered at £3 3s ($14.54) c.i.f. Dunkirk, 20 francs ($1.29) above the American coke price. Sales from American ovens, however, are difficult to negotiate as the French still complain of the condition of cargoes of coke received recently.

IRON TRADE REVIEW's correspondent at Dusseldorf wires that the further slump of the mark has precipitated a new buying wave in the unoccupied German territories. Lack of foreign money prevents the Germans from making purchases abroad. Most of the Rhineland mills and engineering plants are working only two days a week.

British buyers have ordered a few hundred tons of special sheets from the United States. South Americans are inquiring here for tin plate. Price changes in the British market this week bring the following products to the levels as quoted: Billets and sheet bars, £7 15s ($35.77); galvanized sheets £18 17s 6d ($87.11); East Coast hematite and Middlesbrough No. 3 pig iron, £5 17s 6d ($27.11); West Coast hematite, £6 ($27.69); Derbyshire No. 3, £5 5s ($24.23); Northamptonshire No. 3, £5 2s 6d ($23.65); furnace and foundry coke for export, £2 15s ($12.69); home foundry coke, £1 15s ($8.08)

British production of pig iron in May amounted to 710,000 tons compared to 652,200 in April; 633,600 in March; 543,000 in February and 567,900 in January. The production of steel in Great Britain in May totaled 815,000 tons compared to 749,400 in April; 802,500 in March. Blast furnace stacks active on the last day of May numbered 223.

Sterling exchange is figured on a basis of $4.615.

British Buyers and Sellers Near Deadlock

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$4.62

BIRMINGHAM, England, June 1.—Conditions are approaching deadlock between buyers and sellers. Consumers are pressing for further reductions which makers are not prepared to concede. The makers of pig iron express their inability in view of the high price of coke to meet the price ideas of their customers.

Some encouragement has been given by a decided improvement in the Barrow area where a number of contracts have been renewed and inquiry is increasing. A good volume of business has been negotiated for the third quarter in West Coast hematites, on behalf of the continent and home customers in the Midlands, Scotland and South Wales.

Cleveland prices have receded to £6 ($27.72) for No. 3 G. M. B. In that area stocks are small and some manufacturers are in arrears with deliveries. The most noticeable feature is a decided falling off in export business. Coke continues so scarce that sellers are able to renew contracts at the high price of £2 5s ($10.39) delivered, the quotation on the West Coast being £2 8s ($11.08). In the Scotch area prices are weaker.

After maintaining great firmness for some months, Midland smelters have given way to the extent of 2 shillings 6 pence ($.57), Derbyshire irons being sold at £5 7s 6d ($24.82) and Northampton at £5 5s ($24.25). It is obvious that the makers are becoming a little anxious as to the future, and having received a number of inquiries are disposed to renew contracts on the basis of a slight concession. Middlesbrough hematites are selling moderately on the basis of £6 2s 6d ($28.29), and the fair amount of activity at the steelworks seems to promise a reliable market for steelmaking material.

In the steel department consumers are pressing for reductions, but the large steelworks decline to be coerced and many of them are in a comfortable position for two or three months. The importation of cheap Belgian steel has developed a peculiar situation as between the rerolling firms and the large steelworks. Some Birmingham rerollers are buying steel from Belgium on the basis of £7 10s ($34.65) for 2-inch billets, and they can afford to sell their small bars at £10 10s ($48.51). This is much below anything considered by the large steelworks. Increasing doubt is entertained as to the reliability of some of the low Belgian offers made recently, or the ability of the foreign steelworks to ensure regular deliveries. There are cases also where concessions made give no advantage over British prices and the absence of uniformity as between the various Belgian exporters is not a little puzzling to buyers on this side. These conditions, however, do not prevent the carrying through of a certain moderate tonnage of export from Antwerp to various foreign markets to the order of British merchants. As the Belgian is prepared to sell on the basis of £7 17s 6d ($36.37) Antwerp, a fair quantity of finished steel is being handled in this way.

English billets continue on the basis of £8 10s ($39.27) delivered, but some makers quote up to £9 ($41.58), and £8 15s ($40.42) appears to be paid frequently. No great amount of contracting is in progress, consumers having a great deal of material to receive on old contracts. The Welsh makers have confirmed the stabilization arrangement which, in regard to semifinished steel keeps the price of tin and sheet bars at £9 2s 6d ($42.15) with a rebate of 7 shilling 6 pence ($1.72). For good contracts of sheet bars makers can get supplies on the basis of £8 5s ($38.11) delivered.

The tube trade is rather quiet, German competition being more in evidence in the international market. The tubemakers are

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, June 11

British Market

Home Market Prices. Gross Tons at Works or Furnace

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	35.77	7 15 0
Sheet bars	35.77	7 15 0
Wire rods	55.38	12 0 0
FINISHED STEEL		
Steel bars, England, ⅝ to 3-inch	46.15	10 0 0
Steel bars, England, ⅝ to 3-inch, for export	43.84	9 10 0
Plates, ship, bridge and tank, England	42.69	9 5 0
Plates, ship, bridge and tank, Scotland	42.69	9 5 0
Beams, England	43.84	9 10 0
Beams, Scotland	43.84	9 10 0
Sheets, black, 24 gage	57.69	12 10 0
Sheets, black, 24 gage, for export	55.38	12 0 0
Sheets, galvanized, 24 gage	87.11	18 17 6
Rails, 60 pounds and over	46.15	10 0 0
Rails, 60 pounds and over, for export	43.84	9 10 0
Tin plate, base box, 108 pounds	5.31	1 3 0
Steel hoops	55.38	12 0 0
Steel hoops, for export	54.23	11 15 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	27.11	5 17 6
Hematite, West Coast, Mixed Numbers	27.69	6 0 0
Basic Middlesbrough	26.54	5 15 0
No. 3 Foundry, Middlesbrough	27.11	5 17 6
No. 3 Foundry, Derby, Leicester, Nottingham	24.23	5 5 0
No. 3 Foundry, Northamptonshire	23.65	5 2 6
No. 3 Foundry, Staffordshire	24.23	5 5 0
No. 3 Foundry, Scotch	25.38	5 10 0
Ferromanganese, 76 to 80 per cent	83.07	18 0 0
Ferromanganese, 76 to 80 per cent, for export	92.30	20 0 0
COKE		
Yorkshire furnace	6.46	1 8 0
Yorkshire furnace, for export	12.69	2 15 0
Yorkshire foundry	8.08	1 15 0
Yorkshire foundry, for export	12.69	2 15 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	9.30	744,000
Foundry, No. 3, Oberhausen	8.89	711,000
Bessemer Stahleisen, Siegen	9.56	765,000
Foundry, No. 1, Oberhausen	8.93	714,000
Luxemburg Foundry		nominal
COKE		
Ruhr furnace	2.69	215,000
Ruhr foundry	2.75	220,000
SEMIFINISHED STEEL		
Billets	11.24	899,000
Sheet bars	13.74	1,099,000
Wire rods	13.34	1,067,000
FINISHED STEEL		
Standard rails	15.68	1,254,000
Merchant bars	15.63	1,250,000
Structural shapes	15.49	1,239,000
Ship plates	17.61	1,409,000
Medium plates, 3 to 5 millimeters	19.79	1,583,000
Sheets, below 3 millimeters	22.71	1,817,000
Tin plate		nominal
Plain wire	16.68	1,334,000
Bands and strips	18.86	1,509,000
Sheets, below 1 millimeter	24.64	1,971,000

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	30.64	475
Basic bessemer, Lorraine	27.41	425
Foundry, Longwy, No. 3, sand-cast	26.77	415
Foundry, Longwy, No. 3, chill-cast	27.41	425
Ferromanganese, 76 to 80 per cent	99.98	1,550
COKE		
French furnace	8.71	135
German furnace, f.o.b. frontier*	11.61	180
German furnace, f.o.b. frontier**	16.13	250
French foundry	9.35	145
SEMIFINISHED STEEL		
Blooms	32.25	500
Billets	35.48	550
Sheet bars	45.15	700
FINISHED STEEL		
Standard rails	35.48	550
Merchant bars	44.51	690
Angles	41.93	650
Normal beams and profiles	41.93	650
Plates, ship and tank, 10 millimeters and thicker	47.73	740
Plates, bridge and tank, 5 to 10 millimeters	49.02	760
Sheets, black, 3 millimeters	51.60	800
Sheets, blue annealed, 2 millimeters	56.76	880
Shafting, cold-drawn, 40 to 60 millimeters	90.30	1,400
Bars, 2 per cent nickel steel	141.90	2,200

All prices are f.o.b. furnace or works.
*Up to 50 per cent of normal requirements.
**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	29.48	390
Basic open-hearth, Belgian	41.20	545
Gray forge, Belgian	20.41	270
Foundry, No. 3, Belgian	34.40	455
Foundry, No. 3, Luxemburg	37.04	490
Foundry, No. 3, Lorraine	37.04	490
SEMIFINISHED STEEL		
Blooms	37.80	500
Billets	40.07	530
Sheet bars	41.58	550
Wire rods	55.94	740
FINISHED MATERIAL		
Standard rails	54.81	725
Merchant bars	44.98	595
Normal beams and profiles	44.23	585
Plates, 5 millimeters and thicker	51.03	675
Sheets, black, 3 millimeters	54.43	720
Sheets, galvanized, 1 millimeter	139.86	1,850
Plain wire	88.83	1,175
Galvanized wire	100.17	1,325
Wire nails	92.61	1,225

All prices are f.o.b. furnace or works.

assisted by cheaper steel skelp and the lower price of semifinished steel, both of British and foreign origin. Some important works in the Birmingham area, however, are restricting their make entirely to tube from Staffordshire iron skelp. The material for this cannot be bought under £12 15s ($58.90) whereas steel is obtainable at about £11 5s ($51.97). Constructional engineering still is restricted to small undertakings. In spite of satisfactory order books the steelmakers are not getting their specifications as freely as they could wish.

Steel scrap is very nearly stagnant. The consumers still are able to avoid new contracts, and opinions differ widely as to selling prices. A few sales have been made at £4 2s 6d ($19.05) a reduction of about £1 ($4.62) per ton on the price obtained at the quarterly meeting six weeks ago. It is believed that some of the big steelworks will have to enter the market within the next few weeks to renew their supplies.

The railways are proving a very reliable source of business as compared with some other users of steel. Orders for rails have been taken at Barrow and Workington sufficient to occupy the mills for some time and the tires and axles on order are proving useful lines for the Sheffield firms specializing on these products.

Prices are falling steadily for most descriptions of Staffordshire iron, ordinary bars being obtainable at £12 ($55.44) although the nominal figure is £12 10s ($54.45). The Scotch makers of malleable iron have found it necessary to reduce their price 10 shilling ($2.31) per ton, crown bars becoming £12 ($55.44). The makers of nut and bolt iron in Staffordshire have to compete against Belgian No. 3 which has been reduced to £8 17s 6d ($40.99) delivered.

Galvanized sheets are slightly cheaper on the basis of £19 ($87.78) to £19 5s ($88.93). No great amount of business is being booked. The price stabilization committee, comprising members of the Siemens Steel association and of the sheet and tin plate trades have decided to continue for another three months the arrangements under which a rebate of 7 shilling 6 pence ($1.72) per ton in sheet and tin bars is made to the various works. For the present the price of bars continues at £9 2s 6d ($42.15), less rebate.

There is very little new business in the tin plate trade though the mills are well engaged. The selling price is £1 3s 6d ($5.32) per box, a decline of about 2 shilling 6 pence ($0.57) from the peak prices realized in the spring.

Belgian Production Gains

Brussels, June 1.—On April, 36 furnaces were blowing in Belgium as

compared to 38 on March 1. Pig iron production for March amounted to 169,920 tons or 18,580 tons more than in February.

The production of steel ingots amounted to 177,930 tons or 25,700 over the February output; and 6040 tons of steel castings which is 1970 tons more than were manufactured during February.

The output of finished steel products during March amounted to 157,170 as against 142,730 during the preceding month. Comparative data for recent months and years follow:

	Pig iron	Ingots and castings
1913 monthly average	207,058	205,452
1921 monthly average	73,032	65,876
1922 monthly average	133,635	130,304
January, 1923	165,210	178,560
February	151,340	156,300
March	169,920	183,970

French Prices Fall as Coke Declines

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaisance.

Franc—$0.065

PARIS, June 1.—The downward trend of prices has been accentuated by the announcement of cheaper coke. The S. C. O. F. has fixed the price of coke for June and July at 180 francs ($11.70) per metric ton for P.1. and 250 francs ($16.25) for P.2. This is a reduction of 18 francs ($1.17) per metric ton on the P.1. price and the S. C. O. F. hopes to be able to supply her participants with 50 per cent of their normal contract requirements at this figure.

Pig iron production is slowly increasing and has reached 60 per cent of normal. French blast furnaces produced 335,000 tons of pig during April of which 90,000 tons were made in Lorraine. The following figures give the production by months since December 1922:—

	Tons
December	513,000
January	486,210
February	305,526
March	316,146
April	335,000

The French moved into the Ruhr in January and the effect that Ruhr occupation has had upon the iron and steel industry is shown by comparing December's figures with the succeeding months. Customs house statistics disclose that 200,000 tons of pig iron was exported by France during the first quarter of 1923, or an average of 66,000 tons monthly. Thus 18 per cent of the total output was exported.

No. 3 chill cast foundry pig is now quoted at from 430 francs ($27.95) to 450 francs ($29.25) per metric ton f.o.b. furnace. Belgian furnaces are offering No. 3 pig at 400 francs ($26.00) f.o.b. French frontier.

Although steel production has been restricted for several months owing to the fuel shortage the supply still exceeds the demand. Competition is keen and prices are being reduced all along the line. It has been reported that a northern mill has quoted 500 francs ($32.50) on 2 to 4-inch billets. Sarre mills have offered basic bessemer billets to Swiss buyers at 433 francs ($28.14) per metric ton delivered Bale.

The demand for structural shapes is dull. Building materials have reached such high levels that construction work has been stopped in nearly every section of the country. Belgian mills are offering beams for export to France at 600 francs ($39) per metric ton f.o.b. frontier station, duty paid. French mills have had to make readjustments downward to meet this competition. French plate mills are now in position to meet the domestic demand which has fallen off considerably. Heavy plates are quoted at 720 francs ($46.80) and medium gages at 800 francs ($52). A sheet mill in the Western district is offering 0.6 to 1 millimeter sheets at 1700 francs ($110.50) per metric ton.

Bar mills are seeking orders. The price of merchant bars has remained stationary for the last two weeks, ranging from 650 francs ($42.25) to 700 francs ($45.50) depending upon the tonnage involved.

Belgian Iron and Steel Market Stagnant

European Staff Special

Franc—$0.05

BRUSSELS, June 1.—The iron and steel market is stagnant. The demand for merchant bars, plates and wire rods has tapered off sharply during the past week. The railroad strike has slowed up all lines of industry in Belgium. Thousands of tons of merchandise destined for export cannot be moved to the port of embarcation. At Couillet one blast furnace and two batteries of coke ovens have been blown out. Three rolling mills in the Charleroi district will have to lay off their men if the strike is prolonged. Not only are the factories menaced by a shortage of coal, coke and other raw materials, but warehouses are filled with finished products awaiting shipment. Foreign buyers are diverting their orders to other markets in the face of such conditions, as they realize that if the strike drags on Belgian mills will soon be far behind on their deliveries.

Pig iron prices are stationary. Lorraine and Luxemburg furnaces are competing keenly for business in Belgium. The demand for semifinished steel has fallen off and concessions are being made to encourage buytng. Rolling mills are seeking much needed tonnage and prices have been reduced to production costs.

An order covering 12,000 tons of 50-kilo rails for the Belgian State Railways has been divided into four equal lots. Cockerill, Angleur, Providence and Sambre-et-Moselle will share this tonnage.

The following table gives the production of pig iron and steel during April and a comparison of preceding months:—

April, 1923	No. blast furnaces blowing	Pig iron production	Steel production
Hainaut	12	69,270	65,100
Liege	14	74,560	81,670
Other districts	9	28,450	18,330
Total	35	172,280	165,100
March, 1923	36	169,920	177,930
February, 1923	36	151,340	152,230
January, 1923	35	165,210	173,140
December, 1922	34	160,450	164,840

It will be observed that pig iron production increased slightly during April, but the actual output was 35,000 tons less than in April 1913.

Ruhr Still Dominates German Recovery

European Special Service

BERLIN, June 1.—Considerable discussion lately has appeared in the German press over proposals which have been made by Arnold Rechberg for a settlement of the Ruhr question. Herr Rechberg suggests that an understanding might be brought about between France and Germany which would satisfy the French demands by devoting 30 per cent of the total value of all German indusrial undertakings to reparation payments, together with a further 30 per cent of all company profits during a period of 30 years. He claims this to be the development of an idea put forward originally by Cecil Rhodes with the object of co-operation between English, French and German trade by mutual profit sharing.

Although admitting that the war and its after effects has rendered the Rhodes scheme impracticable, Rechberg suggests a possible combination between the three countries for the exploitation of the natural resources of Russia and also thinks that greater participation in the world's trade might be secured by

Germany through an understanding between French capital and German enterprise. He lays emphasis on proposals which have appeared in the German press more than once since 1918, for a union of French and German coal, iron, and steel interests to bridge the gulf caused by the war. Rechberg's suggestions have been supported and elaborated by Dr. Reichert, the head of the German Iron and Steel Masters' association.

In consequence of the occupation of customs houses in the Ruhr territory no exact figures are obtainable, but the following approximate figures with regard to Germany's imports of bituminous coal during March are said to be fairly correct: 3,397,700 tons, compared with 1,421,800 tons in February and a monthly average of 1,409,900 tons in 1922. Germany imported 1,319,400 tons of coal from Great Britain in March as compared with 521,800 tons in February and a monthly average of 649,500 tons during 1922. The imports of bituminous coal are now more than three times the monthly average of 1922.

An amalgamation has been formed of the three German scrap iron syndicates under the name of the Central Bureau of German Scrap merchants. This organization comprises 300 of the most important German scrap iron firms. As scrap iron merchants must in the future be licensed by the government, there have been many applications on the part of new firms for inclusion in the Central Bureau, but only dealers carrying on a legitimate trade are accepted as members.

Negotiations now have been concluded between the Siemens-Rhine-Elbe Schuckert union and the representatives of the Charlottenhutte for the establishment of intimate connections between the leading western iron and steel group and the Upper Silesian group of the Bismarckhutte and the Kattowitz Co. This amalgamation apparently does not include the Laurahutte.

A report on the German machine tool trade for April, 1923, states that there was a considerable decrease of business and a consequent surplus of labor. Unemployment was avoided by working short time. There was a general improvement in the supply of fuel and raw materials but the price of the latter had increased considerably. The German government's index figure for the average cost of living in April, 1923, showed an increase of 2954 over April, 1914, and was 3.5 per cent higher than in March, 1923. In consequence of the decrease in coal prices the cost of heating and lighting fell slightly, but in Berlin the cost of electricity was again increased.

The nominal average wages for skilled workers in Germany are over 2000 times and for unskilled workers nearly 3000 times what they were in 1913. The average wages on a gold basis as compared with 1913 have decreased 26.1 per cent for skilled workers and 1.6 per cent for unskilled workers.

Austrian Business Again on Decline

European Special Service

Austrian Crown—$0.000014

VIENNA, May 30.—The flood of business arising out of the occupation of the Ruhr has ebbed as quickly as it arose. Shipments of Polish and Czecho-Slovakian coal to Germany in April were half those of March and the May shipments were less than April. Prices throughout central Europe are distinctly easier. The Alpine company, the largest producer in Austria, has reduced its quotations on finished steel by 15 to 20 per cent. The mills are still well employed on old orders.

There are now 10 blast-furnace stacks in operation in Czecho-Slovakia. The German owned Mannesmann and Albert Hahn pipe mills in Czecho-Slovakia are exceedingly busy on orders transferred from the Ruhr. The Skoda works has taken an order for the reconstruction of two sugar factories in Russia and for 90 special railroad cars for Finland. The Prager Eisen Gesellschaft is contemplating the extension of its coke ovens at Kladno near Prague and in addition to manufacturing coke the town of Prague will be supplied with gas.

Czech Crown—$0.028

In Russia quotations are beginning to appear on a gold basis and some of the producers in the Urals are now quoting billets at 76.22 gold roubles ($38.11) per ton at the works and 91.46 gold roubles ($45.73) delivered Moscow. It will be noted these prices are about the same as those prevailing elsewhere.

Canadian Steel Sales Continues Active

Foreign Special Service

TORONTO, Ont., June 11.—With the exception of a few inquiries, there is little interest in the pig iron market. Only a few contracts have been closed. An occasional small order is being received for iron for spot delivery. A high rate of production is being maintained with four furnaces operating at Sault Ste. Marie; two at Hamilton; one at Port Colborne, Ont., and three at Sydney, N. S. With the exception of British iron in the Montreal district which has been marked up $1 per ton, warehouse, no change is reported in pig iron prices, which are as follows: No. 1 (2.25 to 2.75 silicon), $36.55; malleable, $36 55; No. 2, (1.75 to 2.25 silicon), $35.55, Toronto. No. 1 and malleable, $38.90; No. 2, $37.90; Summerlee and Carron, imported, $40 per ton, Montreal.

A strong demand for practically all lines of finished iron and steel features the Canadian market. Steel plants in Ontario and Quebec and in the maritime provinces are operating on a larger scale than at any time during the past two years. It is reported the Sault Ste. Marie plants of the Algoma Steel Corp., are being operated at capacity. Three thousand to 4000 men are employed, working on double shifts of about 10 hours each. The company has rail orders on hand from the Canadian Pacific railway and the Canadian National railways of sufficient volume to insure capacity operations for several weeks. Inquiries have been received asking for information on new business.

General activity in building trades throughout the dominion is bringing out a larger demand for structural steel. Orders placed in the week, totaled several thousand tons. Shapes and beams are quoted at 2.70c, Toronto. Bars are in good demand. Local mill representatives say their output has been almost entirely sold for the next three months. Bars are firm at a nominal quotation of 3.10c, Toronto. Car builders are placing orders for plates, and producers report a brisk demand. Plates are 2.60c, Toronto.

Sheet mills are carrying large orders on their books for all varieties. No. 28 black sheets are quoted at 4.60c; No. 10 blue annealed 3.75c, and No. 28 galvanized 6.00c, Toronto.

While there is some demand for heavy melting steel and turnings it is by no means as active as a month ago. Dealers are paying $16 and $13 per gross ton, delivered, Hamilton, respectively. Dealers are offering $18 for steel axles and $21 for wrought iron axles in gross tons, Toronto. Rails are quiet, dealers paying $17 per gross ton, Toronto. The demand from foundries for machinery cast has fallen off. Dealers are offering $22 per net ton, Toronto.

Award Contract for Cells

Contract for the construction of 648 cells at a total cost of $400,000 has been awarded the Van Dorn Iron Works Co., Cleveland, by the state of Indiana. This is said to be the largest individual single contract ever awarded for the construction of cells. The steel will be used in the construction of the new reformatory at Pendleton. The cells contracted for will be similar to those built by the Van Dorn company for Erie, Pa., and Buffalo, N. Y.

Adopting 8-Hour Day in Steel

Recent Progress Made by Independent Manufacturers Pointed Out by Operating Officials in Pittsburgh District—Only Certain Workers at Open Hearths Included in New Program—A Gain in Efficiency

BY JOHN D. KNOX

MANY open-hearth steel plants in the United States have adopted the 8-hour turn in lieu of the 12-hour shift, customary since the establishment of the industry in this country. At some of the plants, however, only the first, second and third helper on each furnace and the charging operator participate in the short turn. The list of companies which have adopted the short turn workday includes the Andrews Steel Co., Newport, Ky.; American Rolling Mill Co., Ashland, Ky., and Middletown O.; Central Steel Co., Massillon, O.; Scullin Steel Co., St. Louis; Youngstown Sheet & Tube Co., Youngstown, O.; National Enameling & Stamping Co., Granite City, Ill.; Trumbull Steel Co., Warren O.; Republic Iron & Steel Co., Youngstown, O., and the Commonwealth Steel Co., Granite City.

At some of the plants at which the change recently was effected the hourly wage rate for the 8-hour turn remains the same as that paid for the 12-hour turn. At other plants the workmen are paid a bonus on the aggregate tonnage produced by all furnaces during the month, in addition to a certain hourly wage.

It is understood the cost of producing a ton of open-hearth steel at a certain plant where an 8-hour day is in effect is only a few cents higher than the cost at a nearby plant which operates on a 12-hour basis. However, at the former plant the bottoms of the open hearths are made up by mechanical means, thereby reducing a large portion of the laborious work entailed ordinarily in shoveling by hand the basic materials on the hearths after a heat has been drawn off. In addition, the furnaces are made ready for charging in a much shorter period, which affords larger production, and all third helpers and door operators are eliminated.

An operating official in the Pittsburgh district points out that many steelworks operators are disappointed over the failure of the American Iron & Steel institute committee, which recently submitted its report on the 12-hour workday, to indicate to the public to what extent the 12-hour day has been disappearing from the steel industry during the past few years. At the rate the 12-hour shifts are declining it will be only five or six years until a working period of this duration in the steel industry will be a matter of history, whether the operators endeavor to abolish it or not, according to a steelwork's executive who has spent a large part of his life in open-hearth plants and steel mills.

Abolishment of the 12-hour day undoubtedly would have been hastened years ago if the workmen would have agreed to the policy. In the case of one blast furnace, the owners in 1917 put the crews on an 8-hour basis but after working on the short turn basis for two weeks, the crews of their own accord asked to return to 12-hour turns, which was done.

To change from a 12-hour to an 8-hour basis at open hearths requires an extra crew per furnace, and under present conditions with a shortage of workmen, operators who have this move in mind are finding it difficult if not impossible to fill the gaps. They point out that it is unfair to permit the public to retain the impression that nothing has been done in this direction and to believe that all steelworkers still are working 12 hours per day and seven days a week. As a matter of fact, less than 25 per cent are on duty 12 hours a day. Those who are so engaged are employed at blast furnaces and open hearths where the continuous character of the melting processes require workmen on constant duty, but affords them long "spells" between casting periods.

A few decades ago both the steelmaking and rolling mill industries were operated on a 12-hour basis, seven days a week, and the day and night crews would work 18 hours continuously once every two weeks, or each crew would stay on duty 24 hours once a month in making the shift from day to night turn or vice versa. At present less than one-fourth of the operators work turns of 12 hours each, while the seven-day-week has disappeared entirely in the rolling mill industry. Rolling mill turns now include an 8, 9, 10 and 11-hour day with but few working 11 hours.

8-Hour Day Successful at Colorado Mills

J. F. Welborn, president, Colorado Fuel & Iron Co., in a letter to Raymond B. Fosdick, a director of the company, states that the company's experience with the 8-hour shift in its mills has been successful, from the standpoint of the interests of the owners and employes. Mr. Fosdick, as a representative of John D. Rockefeller Jr., a large stockholder in the company, turned the letter over to Rev. F. Ernst Johnson, director of the research department of the Federal Council of Churches which has criticized the report of the Iron and Steel institute's committee on the 12-hour shift. The letter states:

"The immediate results from the standpoint of production per man hour and of labor cost per unit of output were satisfactory, and where conditions have been comparable it has been evident that we have lost nothing either in producing cost or output by reason of the change.

"At blast furnaces the labor cost per ton immediately following the introduction of the 8-hour day with the increase of 10 per cent in wage rates, increased slightly over 1 per cent above former costs. At open-hearth furnaces it increased 1½ per cent while at our rolling mills there was a substantial reduction in the labor cost per ton.

"The trend of production per man hours, with unimportant exceptions, has been upward since the adoption of the 8-hour day; and in every department of our steel manufacturing operations, from blast furnace to the wire mill, our production per man hour is now greater than it was when all of these activities were operated on the 12-hour shift.

"Comparing these results of the last few months with periods of similar production when basic rates were 10 per cent lower than current rates and the working time 12 hours per day, we find that almost without exception our labor cost per ton is lower than in the earlier periods."

Workers Not Objecting, Says Secretary Mellon

Washington, June 12.—Secretary of the Treasury Mellon is understood to feel that entirely too much is being made of the 12-hour shift matter. The workmen themselves are used to the long shift and are not the ones now objecting, he believes. Further, only a small percentage of workers in the iron and steel industry are working 12 hours a day, and they are not engaged at arduous labor the entire 12 hours but merely are on duty for that length of time. Mr. Mellon is interested in many iron and steel enterprises in the Pittsburgh district.

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Curve of Building Turns Down

THE INEVITABLE result of the sweeping advances in the cost of building is seen in the distinct reaction recorded in the building industry during May. During the month the volume of construction awards fell off 7 per cent. In ordinary years the momentum of spring activity in building usually continues until midyear. Yet when the extent of the recent widespread movement to suspend construction projects and the publicity it has received, are considered, the recession is remarkably moderate.

As computed by the F. W. Dodge Co., and pictured in the Business Trend of IRON TRADE REVIEW this week, the aggregate volume of awards for new structures in May was 60,844,300 square feet. This compares with 65,378,100 square feet in April and 60,361,700 square feet in May, 1922. With the exception of the two months immediately preceding, the May total was the largest in the history of the country. The most striking feature of the record is the drop in residential building and the sharp increase of industrial construction. In May awards for residental construction fell 12 per cent below April to 34,331,000 square feet. They were 11 per cent ahead of the same month one year before. Industrial building, on the other hand, made a gain of 47 per cent over April and of 48 per cent over May, 1922.

This conflicting trend is bearing out predictions made earlier in the year. It was believed then that home builders would be unable long to compete for materials and supplies in the rising market with public projects and industries. The trade improvement of recent months has justified a degree of industrial expansion. There is no hint of the excesses in this direction now such as characterized 1920. This is shown by the fact that industrial building has been running from one-half to two-thirds less than the monthly totals of late 1919 and early 1920.

How soon the building industry will recover its fading bloom is not clear at this moment. Some doubt whether labor costs and material prices will have become sufficiently attractive to cause a large resumption of building this year. In New York a threatened strike has been averted by settlement of wage demands with a $1 a day increase. It is significant that both employers and the unions have raised barriers to further "snowballing" of wages. This may help prevent additional inflation. In May building costs advanced 4 points to 108 per cent over 1913. They are up nearly 35 per cent in a year.

The attitude of bankers probably will have considerable influence upon future developments. Recently the former have begun to tighten the purse strings on construction loans. They regard present price levels as an unhealthy basis for investment or financing. Until they are satisfied that building costs are on a stable and healthy basis, the industry is not likely to receive much new impetus. Meanwhile the unsatisfied needs of the country in new buildings are large and an enormous amount of work is underway.

Railroads Need Many Cars

THAT American railroads are almost four years behind their needs in rolling stock is susceptible of approximate proof from the statistics of car buying over a period of years. From 1901 to 1914, inclusive, the average number of freight cars bought was 165,000 annually. The next seven years, 1915 to 1921, inclusive, found only 85,857 cars bought on the average each year. Thus instead of the 1,155,000 cars which would have been bought in this 7-year period based on the average of the previous years, the actual number of cars acquired by the railroads was 601,000. This leaves a deficit of 554,000 cars, equal to 3½ years' buying at the average rate of 165,000 annually.

In 1922 the total car sales reached 180,000, thus returning to the normal volume of orders. But much of this business was placed late in the year and was carried over into 1923 deliveries. For five months this year sales have covered about 80,000 cars, leaving approximately 80,000 cars yet to be bought to bring

1923 up to the average. With the large number of 1922 sales left over for the shops to complete this year and the sales made this year to date, builders have almost capacity business to the end of December.

It would appear that car shop capacity is insufficient to allow the full deficit in cars to be met within the next few years, even though orders make it possible to operate at the maximum. Another factor, however, now is operating to slow up deliveries. This is the present inability of steel mills to supply sufficient material to meet the needs of builders, which has lessened the serviceable capacity of the latter's shops. At any rate, the demand for steel for railroad equipment promises to afford a good backbone of tonnage to the mills for several years.

Scientific Management Proves Value

THAT revolutionary changes are being made in the conduct of business, and in co-ordinating various branches of manufacturing enterprises through scientific management is obvious from summaries such as presented at the meeting of the Taylor society in Syracuse, N. Y., last week.

The value of scientific planning of routine operations, merely one of the principles of management, as understood and propagated by Frederick W. Taylor, has been demonstrated many times. Business in general is moving forward to a higher plane of efficiency as the soundness of those principles is proved.

There is this to be said, however, in regard to the "Taylor principles" in management, and that is they are solely a means to an end, a force for the success of a business establishment, when the establishment is managed by men of energy, personality and creative imagination. They are instruments for control, and while their adoption is evidence of good judgment, that in itself does not constitute success.

An official of a large steel manufacturng company who is not familiar with the work of Taylor or of the activities of the Taylor society, may not know or care much about scientific management, but his company is successful, nevertheless. Many conspicuous examples of success before the formation of the Taylor society or even scientific planning was heard of, could be cited, but that is no reflection on the Taylor principles. It means that certain executives are able to overcome the disadvantages of laxities in management, that their profits are satisfactory without special attention being given to "minor details." Some men of great intellectuality have been able to overcome the handicaps imposed on them by ill-health, leading others to slight their bodies, but that does not detract from the value of good health.

With executive capacity substantially the same as between two competitors, that concern which is reinforced by engineering skill and practical scientific management is almost certain to win. It is conceivable that all industrial establishments some day will operate on the highest plane of efficiency that business engineering can develop. Science alone will not solve the problem, but science plus personality is an unbeatable combination.

Concerted Price Collection Barred

ACTIVITIES of trade associations within the law as they have been conducted during the past, have been considerably circumscribed as well as clarified by the recent judgments of the Supreme Court of the United States. The so-called hardwood lumber decision rendered last December held that the open price plan as practiced by the association while not actually price fixing, constituted a combination to restrict production and to increase prices and therefore was inhibited by the Sherman anti-trust act. During the past week the supreme court has passed upon the open price plan as pursued by the linseed oil manufacturers and has ruled that the collection and exchange of price and market information among its membership tends to suppress competition in trade and therefore is unlawful. The linseed oil manufacturers entered into a formal contract with a special bureau under which they agreed to furnish full reports of sales, quotations, offerings and other information and receive in return similar advice concerning the affairs of their competitors. Apart from price and market data, the information given and received applied to credits, manufacturing economies, uniform cost accounting, equitable freight tariffs and classifications, standardization of product, export development, etc.

Obviously the trend of judical opinion is against the concerted collection and use of current price and market data especially as to uncompleted transactions and trade associations get into trouble when they undertake this sort of service to their members. Yet some of these associations apparently have made the individual and collective advantages to be so derived in competitive effort, their chief reason for existing. It is not strange that some of them now find themselves in a defensive position which is embarrassing the whole trade association movement.

There are plenty of highly constructive things that trade associations may do for their members, apart from price guidance. Attorney General Daughterty in correspondence with Secretary Hoover one year ago informally pointed out numerous useful functions which such associations may perform, in his opinion, without infringing upon the law. Some such general purpose undoubtedly must mark the future course for organizations of this type. Under such circumstances the individual member, in price and market matters will be obliged to rely more upon his own judgment or upon those sources of information which are equally available to his competitor and to the buyer.

Industrial Activity Is Shown

Great May Records for Pig Iron and Steel and for Freight Movements Demonstrate Large Current Consumption—Spring Peak Is Passed, However—Railroads' Earnings Rise—May Building Shows Slump—Industrial Awards Increase

BY JOHN W. HILL, FINANCIAL EDITOR

NO EVIDENCE of the widespread curtailment of industrial activities, about which much has been heard of late, is to be found in the May records of freight movements and pig iron and steel ingot production. Car loadings in the week ended May 26 climbed across the 1,000,000-mark. That never has happened before at this time of the year. It has occurred, in fact, in only seven previous instances, in two weeks of October 1922, and five weeks in the fall of 1920. Pig iron production broke all records. Gross ingot output for May was the largest in history. The daily average record of 155,744 tons was down a shade under the high mark of April of 157,911 tons but with that exception it was the greatest for all time.

These exhibits would seem to indicate that some of the recent pessimism had been overworked. It is true that the freight movements and the steel production represented orders placed earlier in the year and before the epidemic of excessive caution. However, the enormous distribution of goods and the great basic outputs reflect current needs and consumption. If this was not so there would have been a tremendous piling up of stocks. This is apparent nowhere save in the petroleum industry. Moreover, there has been no appearance of cancellations in steel or elsewhere, nor other indications of over calculation of requirements during the first optimistic months of the year. The steel industry would not likely continue to strain for new production records if the backlog of orders was rapidly diminishing and if no new business was in sight. The unfilled tonnage report of the United States Steel Corp. for May 31 shows a decline of only 307,158 tons or 4.21 per cent in the aggregate bookings. Undoubtedly the peak of the so-called spring boom has passed, but much substantial business remains to be done.

The railroads are buying fewer cars but they are actively in the market for locomotives and for rails. Their ability to buy has been enormously enhanced by their recent earnings.

The May building construction record, pictured in the Business Trend, reflects the curtailment of building due to high costs. Total square feet awards in 27 northeastern states of 60,844,300 square feet shows a drop of 7 per cent from April. The losses were mostly confined to the East. The South and the Middle West show gains. Of utmost significance was the 47 per cent increase in industrial building in May, against 12 per cent loss for residences.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	Average 1913
Business failures	334	268	356	440	300
Cash ratio Fed. Res. System	75.7	76.1	76.1	77.0	...
Loan rate, 4-6 Mo. N. Y. (per cent)	5-5¼	5-5¼	5-5¼	4¼	5¼-6
Aver. 25 ind'l shares	$109.71	$108.54	$108.82	$96.69	$58.19
Aver. 25 rail shares	$63.65	$60.58	$61.59	$61.49	$82.95
Ave. 40 bonds	$77.86	$77.72	$77.39	$79.87	$93.00
Car loadings (week ended May 26)	1,041,029	991,797	963,767	806,877	*800,960
Bank debits 243 cities (000 omitted)	$10,183,000	$7,853,000	$9,527,257	$9,955,187	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	June 11 (close)	Week before	Mo. ago	Yr. ago
Sterling	$4.86	$4.61	$4.62	$4.62	$4.50
Francs	19.3c	6.44c	6.40c	6.64c	9.13c
Lira	19.3c	4.65c	4.61c	4.89c	5.22c
Marks	23.8c	0.0012c	0.0014c	0.0023c	0.35c

MONTHLY COMPARISON

	May	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$380,719,000	$358,693,000	$362,590,000	$71,450,000
Business failures:				
Number	1530	1520	1960	1336
Liabilities	$41,000,000	$46,991,941	$44,403,000	$22,723,000
Exports	*$340,970,000	$341,162,000	$329,979,000	$207,000,000
Excess of gold imports	*$8,533,235	$5,559,257	$10,664,000	†$630,716
Bureau of Labor Price Index	159	159	143	100
Bradstreet's Price Index	147.8	150.1	126.6	100
Economist's British Price Index	4412	4440	4372	2717
Cost of Living Index	159.1	159.2	154.8	100
New incorporations	$1,006,258,000	$500,819,000	$792,373,000	$172,301,000
Railroad net earnings	*$83,197,800	$83,568,000	$49,919,000	$59,900,000

*April. †Monthly average excess exports.

The Business Trend

June 14, 1923

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Industrial activities still phenomenal but past spring peak in many lines; labor shortage less acute; price trend slightly down for last two months but no precipitate decline in sight; some increase in demand for copper, iron and steel, cotton and other basic commodities.

INDUSTRIAL PRODUCTION—May daily average pig iron output of 124,722 tons is new high record; was 9 per cent over war peak of September 1918; May daily average ingot production of 155,744 tons was slightly under April, but gross was greatest in history.

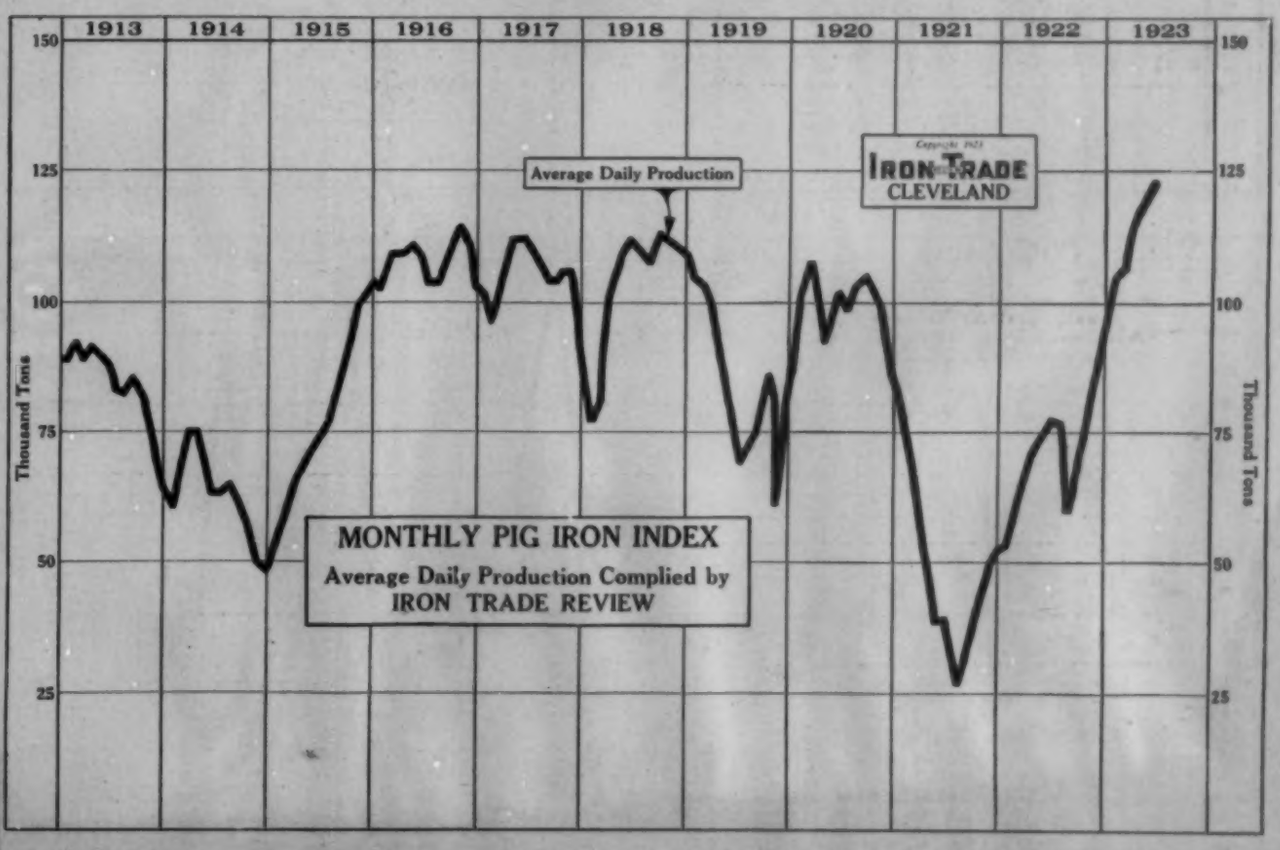
FREIGHT TRAFFIC—Car loading for week ended May 26 cross 1,000,000 mark for first time in any spring season; average weekly loadings in May highest in history save for October, 1920.

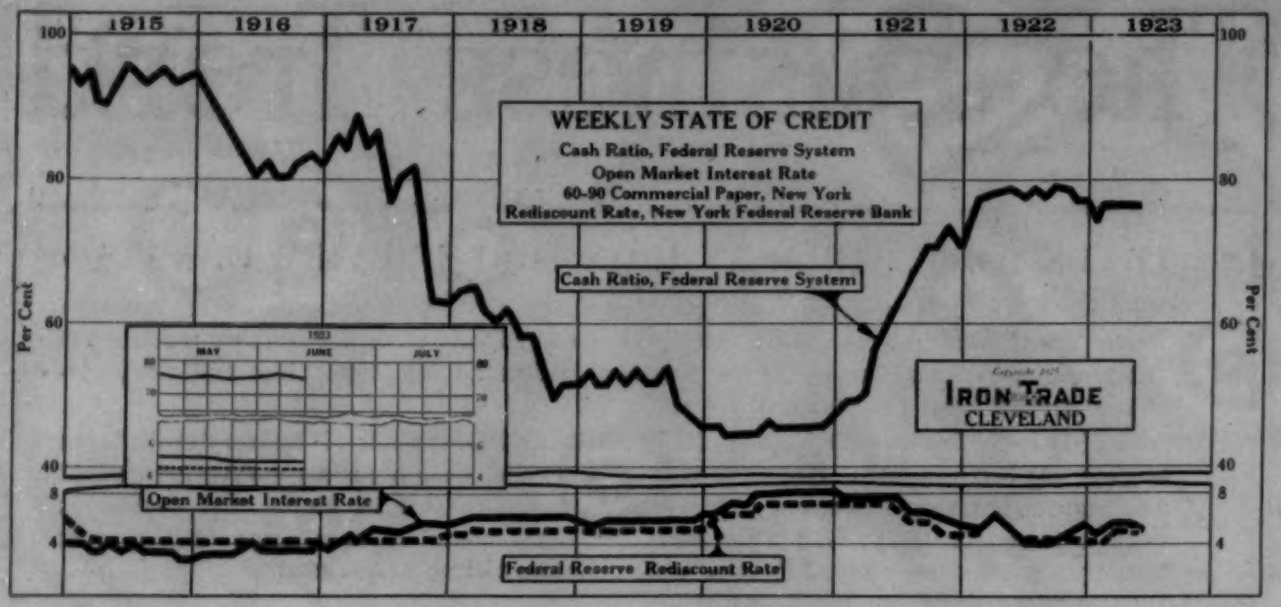
CAR ORDERS—May awards for freight cars by railroads of 2200 smallest since last August; compares with 9800 in April and 18,250 in May 1922; five months' awards 79,000 against 87,000 same period 1922.

BUILDING—Effects of "builders' strike" seen in 7 per cent drop in construction awards in square feet in May; chief decline in East; home building drops 12 per cent; industrial up 47 per cent.

RAIL EARNINGS—Class 1 roads for April show net earnings of $83,197,000; is at rate of 6½ per cent on property valuation; highest since resumption of private control.

CREDIT SITUATION—Commercial rediscounts of federal reserve board at $730,000,000 highest for years; compare with $2,500,000,000 at same date in 1920; cash ratio high at over 75 per cent.

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WEEKLY STATE OF CREDIT
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Open Market Interest Rate
60-90 Commercial Paper, New York
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Cash Ratio, Federal Reserve System
Per Cent
Open Market Interest Rate
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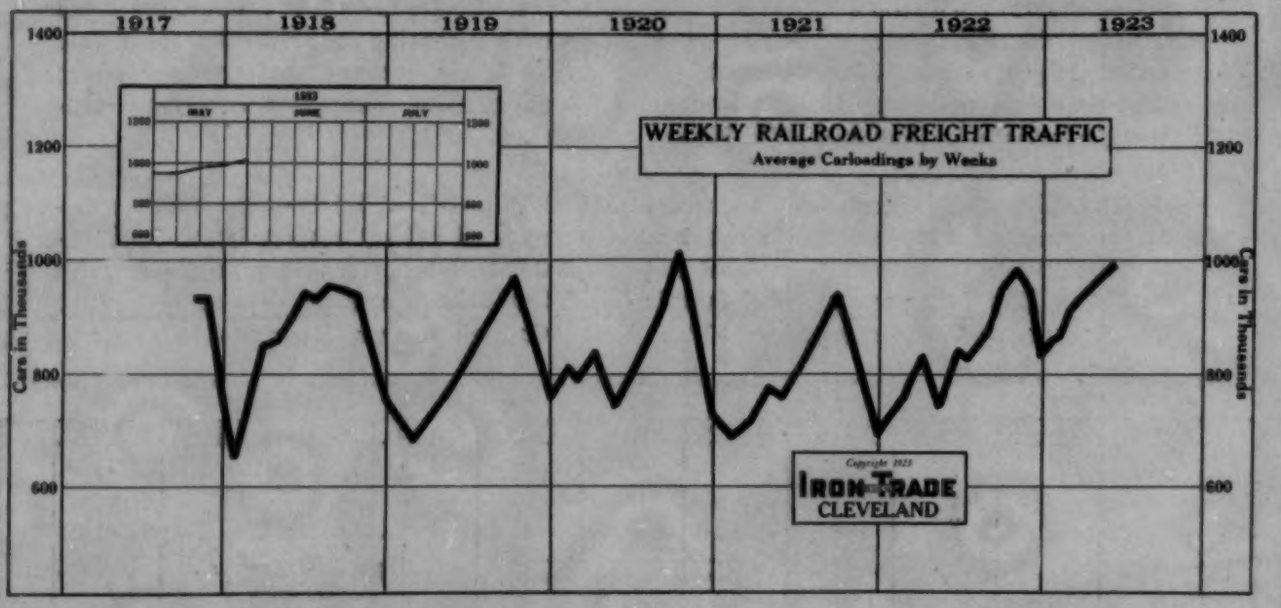
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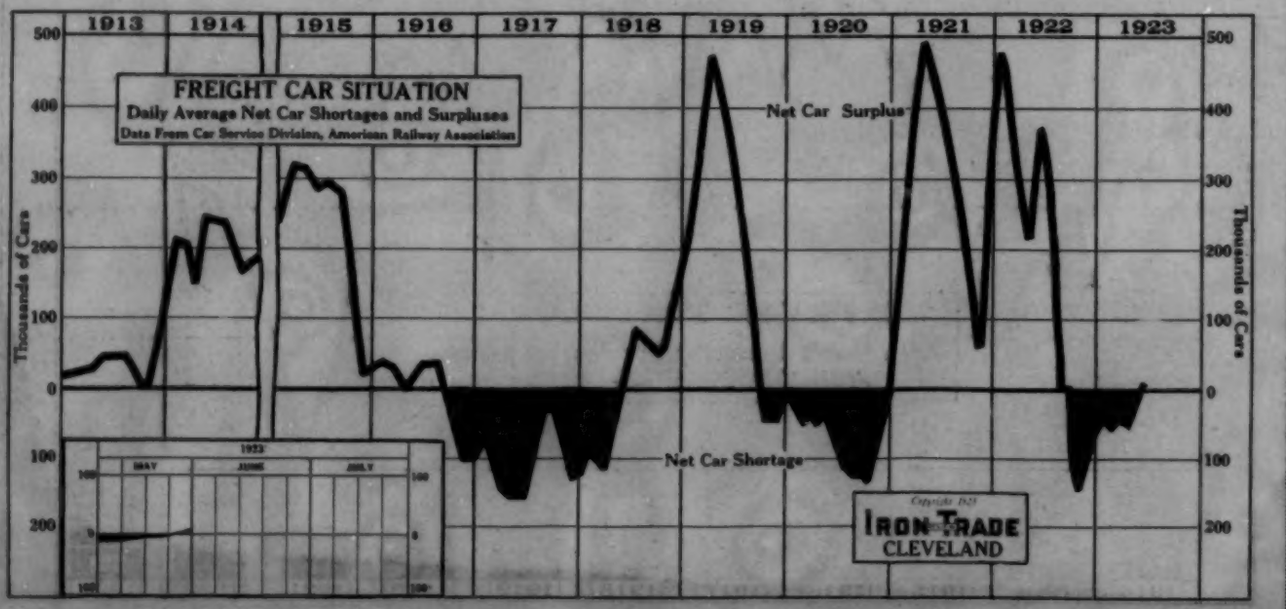
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
Cars in Thousands
IRON TRADE
CLEVELAND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Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
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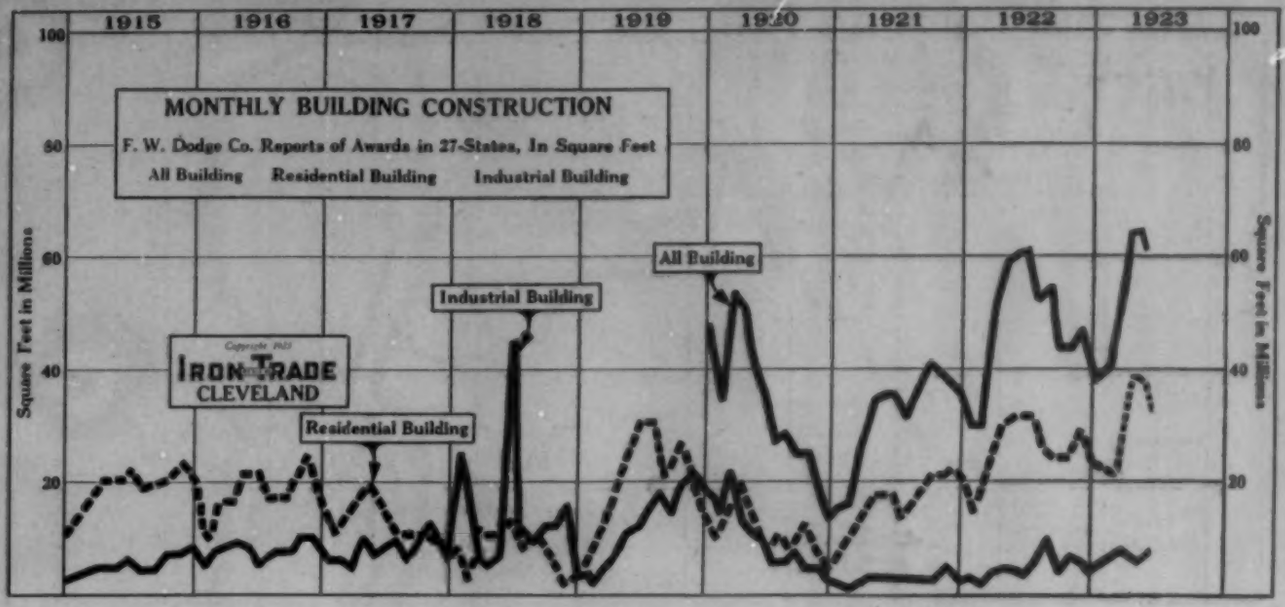
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F. W. Dodge Co. Reports of Awards in 27-States, In Square Feet
All Building
Residential Building
Industrial Building
Square Feet in Millions
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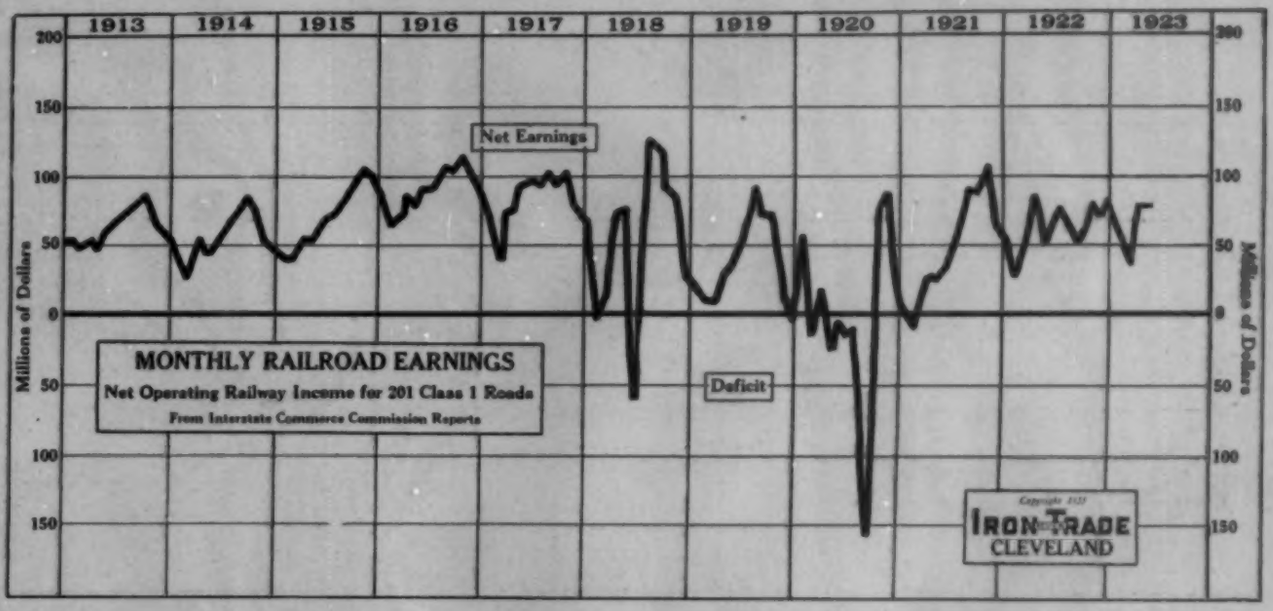
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Net Operating Railway Income for 201 Class 1 Roads
From Interstate Commerce Commission Reports
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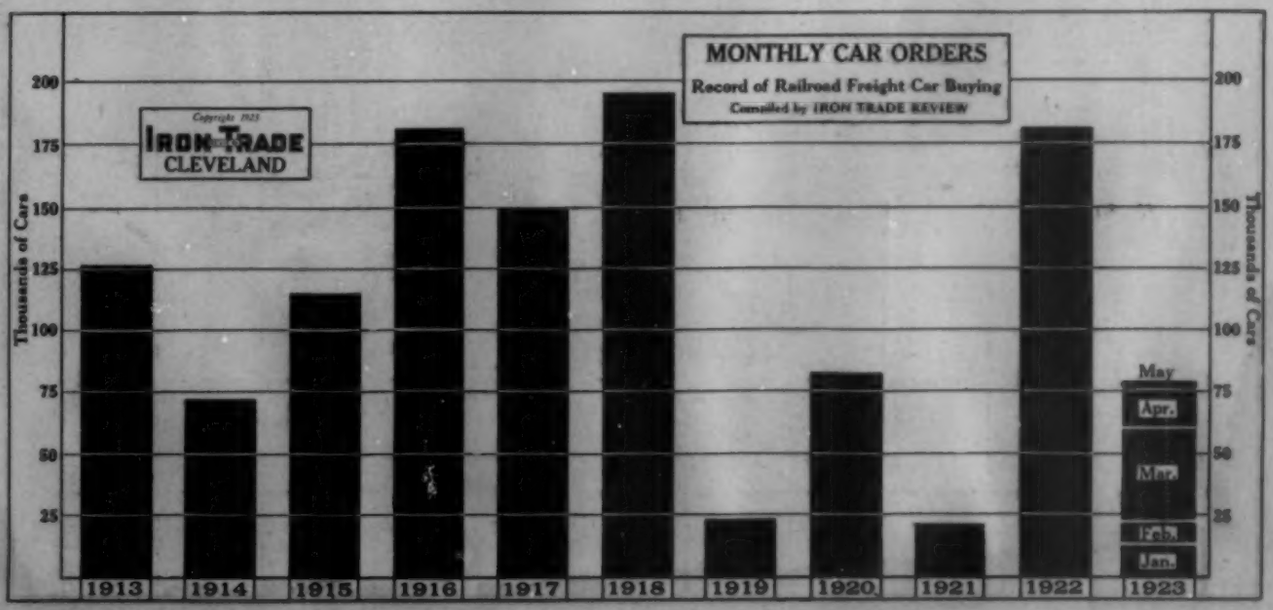
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Record of Railroad Freight Car Buying
Compiled by IRON TRADE REVIEW
IRON TRADE
CLEVELAND
Thousands of Cars
May
Apr.
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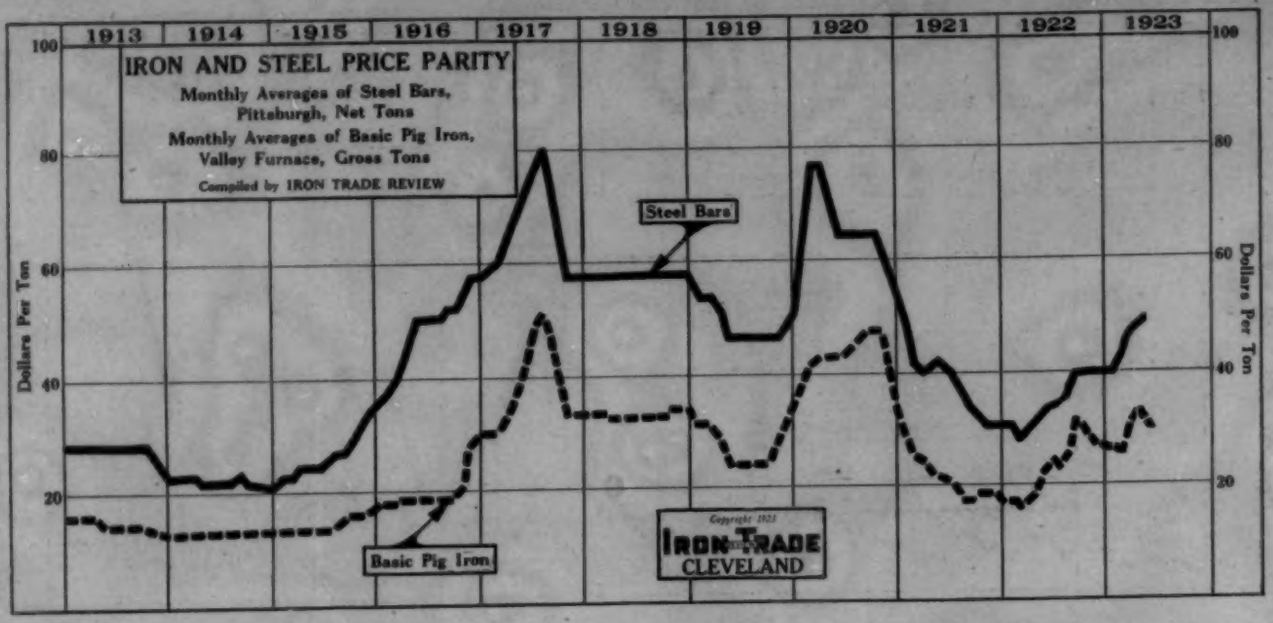
1923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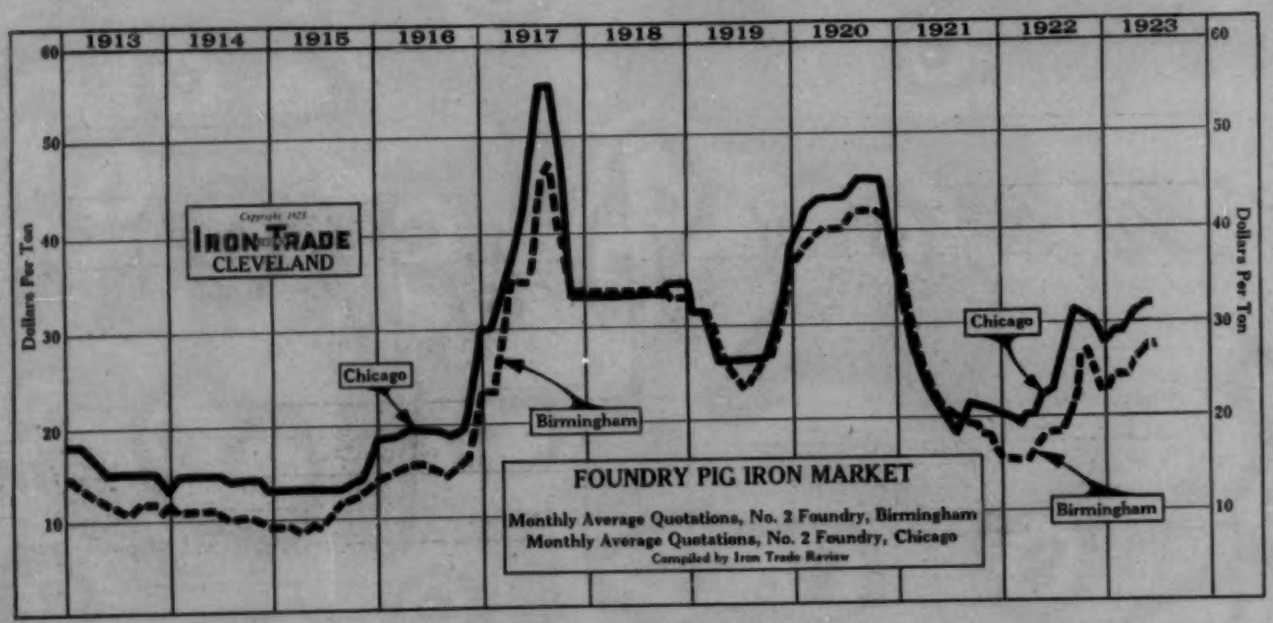
Monthly Averages of Basic Pig Iron, Valley Furnace, Gross Tons
Compiled by IRON TRADE REVIEW
Steel Bars
Basic Pig Iron
Dollars Per Ton
1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
IRON TRADE CLEVELAND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Monthly Average Quotations, No. 2 Foundry, Birmingham
Monthly Average Quotations, No. 2 Foundry, Chicago
Compiled by Iron Trade Review
Chicago
Birmingham
Dollars Per Ton
1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
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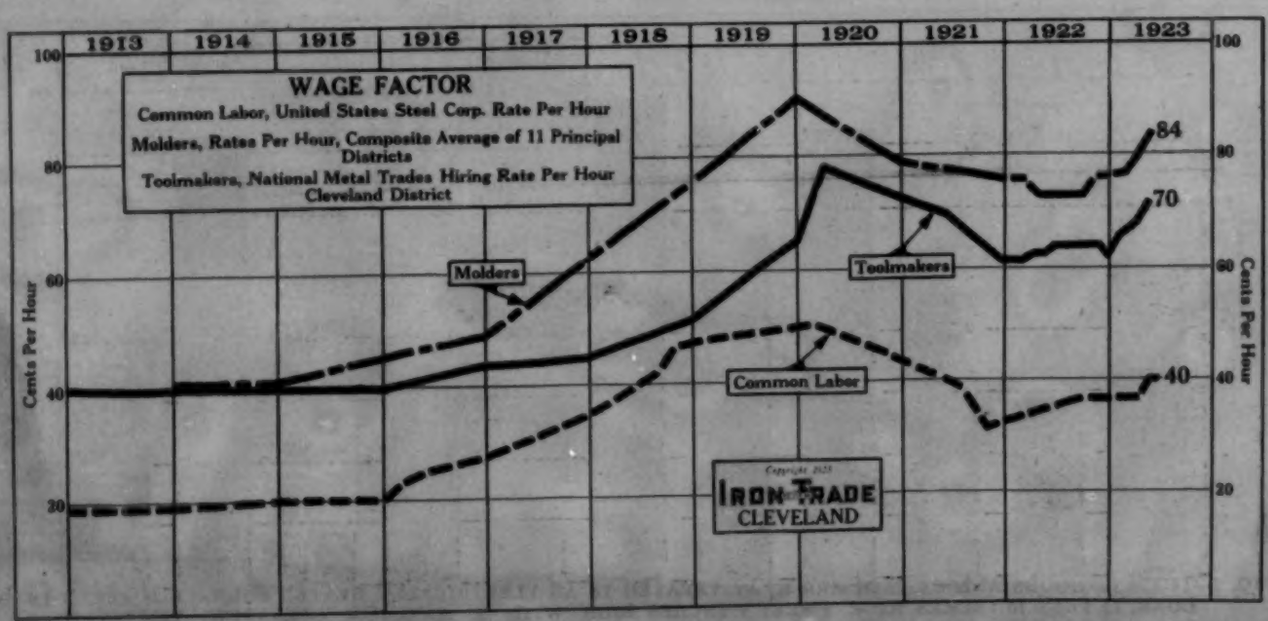
WAGE FACTOR
Common Labor, United States Steel Corp. Rate Per Hour
Molders, Rates Per Hour, Composite Average of 11 Principal Districts
Toolmakers, National Metal Trades Hiring Rate Per Hour Cleveland District
Molders
Toolmakers
Common Labor
84
70
40
Cents Per Hour
1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
IRON TRADE CLEVELAND

Heat Treat To Remove Strains

Large Turbine Frames and Other Castings of a Similar Character Are Heat Treated in a Special Electrically Heated Oven in Which the Casting Is Raised to Approximately 700 Degrees Fahr.

BY PAT DWYER

UTILIZATION of electric current for heating various types of furnaces has reached a high point of development in the United States. This condition is attributable to many causes, but probably the greatest single factor lay in the invention of the nickel-chromium alloys consisting of nickel with a chromium content up to 20 per cent patented for use in electrical heating by A. L. Marsh in 1906.

At first glance the use of electrical energy for industrial heating has nothing to commend it. The prime mover seldom has more than 15 per cent thermal efficiency and this in addition to the unavoidable transmission losses and furnace losses reduces the actual available efficiency to anywhere from 9 to 12 per cent. However, a little study and careful comparison of various types of combustion furnaces will indicate that the use of electric current for industrial heating furnaces is not so extravagant as a hurried examination would lead one to infer. Many well designed and properly operated combustion furnaces will present a thermal efficiency of 60 per cent, and in a few instances, perhaps a little better; but a far greater number, if carefully tested would show a thermal efficiency rating of between 8 and 15 per cent.

Efficiency Little Considered

Thermal efficiency probably was given the least consideration of any of the factors involved in the evolution of electrical heating. Convenience, cleanliness, portability, simple and automatic temperature control and furnace atmosphere, uniformity and the results depending on these features were the controlling factors in the minds of those interested in the process. Advocates of the electric furnace claim that in spite of a slightly higher cost of heating element, the ultimate cost is lower than that of heat derived from direct combustion owing to the lower percentage of spoiled work and also to the saving effected in direct attendant labor cost.

The General Electric Co., has done a considerable amount of pioneer work in developing nickel-chromium resistors. Finally it evolved a commercial design, undertook an extensive advertising campaign, sold the equipment to furnace builders and co-operated with them in erection and installation. In proof of the fact that it has faith in its own product, the company built ovens and furnaces of various types at its several plants, including the large annealing oven shown in the accompanying illustration Fig. 1. This oven is in the heavy iron foundry of the company's plant at Schenectady, N. Y., a plant which when operating at capacity employs 20,000 people.

The entrance to the heat treating furnace, the arrangement of the heating element on the side wall, the track and one of the castings to be treated, are shown in Fig. 1. The heating chamber is 15 feet 10 inches wide, 27 feet 7 inches long and 8 feet 7 inches high. The maximum operating temperature is 1000 degrees

FIG. 1—TURBINE HOODS AND CASINGS ARE HEAT TREATED IN AN ELECTRICALLY HEATED FURNACE 27 FEET 7 INCHES LONG, 15 FEET 10 INCHES WIDE, 8 FEET 7 INCHES HIGH WITH A MAXIMUM OPERATING TEMPERATURE OF 1000 DEGREES FAHR.

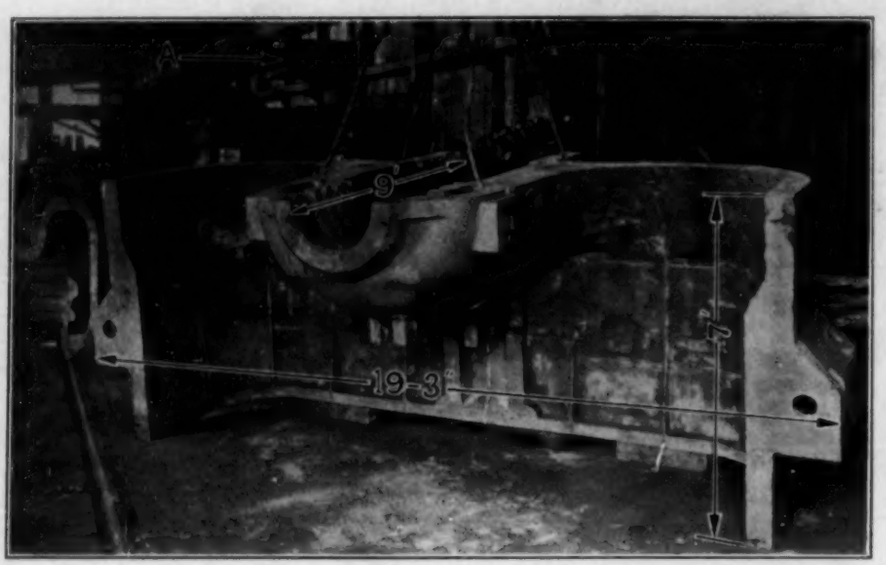

FIG. 2—INSIDE FACE OF TURBINE EXHAUST HOOD IN WHICH THE CONTRACTION IS OVER 2 INCHES IN TOTAL LENGTH

Fahr. It has a capacity of 620 kilowatts when operating at 550 volts, 3-phase alternating current. A long ribbon of nichrome or chromel is suspended from alundum plugs imbedded in the fire brick of the furnace walls or resting on nickel-chromium supports placed in the walls. The furnace wall is made up of an inner lining of heat insulating brick laid up against a sheet steel casing. The molded alundum ribbon support insulators and spacers are laid in the refractory brick lining. A spacing block is laid between the insulators of adjacent windings. The insulators, spacers and spacing blocks are fitted at the back into a steel channel in the form of a ring made up of a number of sectors tied together by bolted clamps. An opening is provided in the spacing block for the pyrometer tube, with a similar opening being provided for the ribbon pyrometer tube placed in the support insulator.

The car on which the casing is carried into and out of the heat treating furnace is protected on top by a single brick lining and the door, permanently attached to the end of the car, also is provided with a brick lining designed to fit closely in a corresponding recess in the end walls of the furnace. The car frame is made up of strongly braced steel channels and is mounted on three pairs of wheels running in ball bearing journals. One pair of wheels is attached close to each end of the car and the third pair supports the center.

Temperature Control

Cast iron stools, 12 inches high, support the casting on the car at a sufficient height to permit free circulation of the heat. Where the lower face of the casting departs from a straight line, lower stools and wedges are employed to support the weight. Great care is exercised in blocking the casting accurately on the car to prevent it from warping out of shape during the heating process. In practice the casting is brought up to 700 degrees Fahr., in about 3 hours. It is held at that temperature for about 5 hours, then the current is shut off and the furnace is allowed to cool gradually for about 10 hours. At the expiration of that time the casting has dropped in temperature to between 200 and 300 degress Fahr., and is removed from the furnace and prepared for shipment to the machine shop. The crane is employed to pull the car back and forth through the medium of a long chain attached to the ends and running in a narrow channel below the floor and between the rails.

FIG. 3—OUTSIDE FACE OF THE SAME CASTING SHOWN IN FIG. 2

The casting from the turbine exhaust hood shown in Figs. 1, 2 and 3 and other castings of a somewhat similar character, present interesting problems for the foundryman during the cooling process and while still in the mold. Although the greatest care is observed in making the mold and stripping the casting, care based on a high degree of skill and long experience, uneven, internal strains are developed, due to contraction, varying metal thickness and resistance offered by the cores. For example, by referring to the overall dimensions on the casting shown in Fig. 2, 19 feet 3 inches in length, 7 feet high and 9 feet wide and allowing the standard contraction of ⅛-inch to the foot, it is apparent that the casting is 2½ inches shorter, ⅞-inch lower and 1⅛-inch narrower than the pattern. The part of the mold forming the interior of the casting offers a certain amount of resistance to the contracting metal and in that manner internal strains are set up in the casting. Upon reheating the casting and then allowing it to cool under conditions where no resistance is offered, these strains practically are eliminated.

The immense plant of the General Electric Co. at Schenectady is laid out somewhat after the style of a one-street town in which all the shops face each other across the width of one long straight main street. The analogy further is carried out by the fact that the different departments are known and referred to by numbers instead of by title. Thus the nonferrous foundry, the steel foundry, the light and medium weight gray iron foundry situated at various points along the main street are listed under appropriate individual num-

bers depending on the location. The numbers begin at one end of the street where the general offices are located and as a result the heavy work gray iron foundry situated about a mile distant is known as 95.

This foundry is equipped in a special manner for the production of all kinds of heavy castings that enter into the construction of electrical power installations. The turbine exhaust hood castings shown in the accompanying illustrations are fairly typical of the work and the methods employed in handling it. The high brick and steel building is exceptionally well lighted and is equipped with four electric traveling cranes made by the Morgan Engineering Co., Alliance, O. One crane has a lifting capacity of 50 tons, a second is capable of lifting 40 tons and the remaining two are rated at 30 tons each.

Melt in Two Cupolas

Iron for the castings is melted in two cupolas, one 72 inches inside the lining, the other 84 inches. One was supplied by the J. W. Paxson Co., Philadelphia and the other by the Whiting Corp., Harvey, Ill. The cupolas are located side by side and are served from one charging platform. The two cupolas combined have an approximate hourly melting capacity of 57 tons.

Shop scrap, gates, sprues, defective castings, etc., are loaded in steel boxes and transferred by one of the cranes to an extension from the charging platform projecting under the crane runway in front of the cupolas. This feature may be noted at *A* in the two illustrations Figs. 2 and 3. The scrap is collected by the night men and loaded into pans and by lifting it to the platform by the crane, a considerable amount of trucking is eliminated and in addition, the elevator is relieved of a corresponding number of lifts.

Cleaning Room Separate

The cleaning room, partly shown in Figs. 2 and 3 is separated from the molding department by a brick partition about 10 feet high. The partition is high enough to separate the floor into two compartments and yet low enough to permit the cranes to convey loads from one end of the building to the other. A narrow gage track along the center of the main bay extends the full length of the building and also connects with other tracks in the yard thus facilitating the passage of heavy flasks and other material into and out of the foundry. The cleaning room is paved with wood blocks, the floor of the core room is made of concrete smoothly surfaced and the molding floor is made of sand.

Order and neatness, notoriously difficult to maintain in a foundry devoted to the manufacture of large castings are both greatly in evidence in the foundries of the General Electric Co., but nowhere perhaps more so than in the core room shown in Fig. 5. Many of the large molds are made almost entirely in cores and for that reason the core room is almost as extensive as the foundry.

Several pits are provided in the floor for the purpose of enclosing molds for large castings, typical examples of which are shown in Figs. 2, 3 and 4. From the front and back views of the turbine exhaust hood shown in Figs. 2 and 3 it will be noted that the walls were formed by a large number of cores. This arrangement gives in effect a dry sand mold, but one that is more flexible, easily assembled and readily dried than in instances where the mold is formed all in one section according to usual practice. An example of the latter method is shown in Fig. 4, showing a pattern which also serves as a corebox for a turbine exhaust casing. The illustration also shows the body of sand forming the entire interior of the mold and in addition the general features of the cast-iron pit above the floor level.

FIG. 4—SKELETON PATTERN FORMS BOTH INSIDE AND OUTSIDE OF THE MOLD—THE BODY OF SAND FORMING THE INTERIOR OF THE MOLD IS SUPPORTED ON A CAST IRON ARBOR

To Mold Convex Side Down

The pattern was made in one of the company's other plants and designed to be molded convex side down and with the large body of sand forming the interior suspended from the cope. This plan did not appeal to the Schenectady foundry executives and a

set of rigging was developed to mold the pattern in the manner indicated in the illustration.

The pattern was leveled on the bottom of the pit in such manner that the upper surface was flush with the top flange on the casing. Sand was rammed around the outside up to the line *B* Fig. 4. A heavy cast iron arbor, two ends of which are shown projecting from the sand at *C* Fig. 4 was adjusted on suitable stands and then the inside of the platform was filled with sand, rodded where necessary and rammed. The sand was struck off flush to form a vertical parting on the face of the pattern and this face of the mold afterward was covered with loamed plates. A parting was made immediately above the arbor shown at *C* and sand to form the semicircular section of the mold was rammed on a suitable lifting plate. A second parting was made on the outside of the pattern along the line indicated at *B* and a lifting plate set on to carry the body of sand forming the outside of the mold up to the top of the pattern. A number of covering cores served to complete the mold.

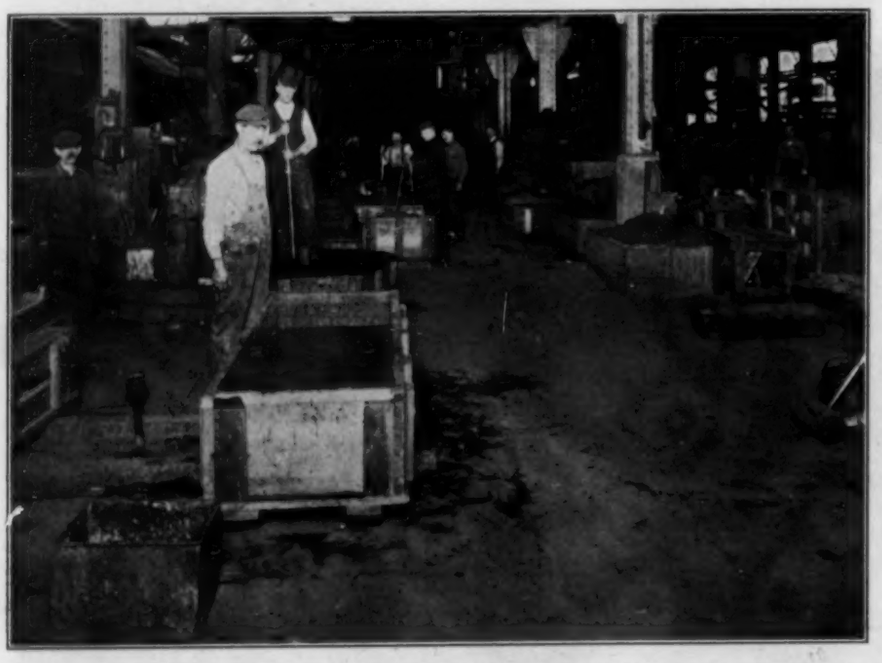

FIG. 5—THE CORE ROOM IS MAINTAINED AT ALL TIMES IN AN EXCEPTIONALLY CLEAN AND TIDY CONDITION

Pattern Made in Several Sections

The pattern was made in several sections and held together temporarily by dogs during the ramming process. After the sand had been rammed to the top, the back lifting plate with its body of sand was removed first. The top section of the pattern then was drawn out of the sand followed by the semicircular inner body of sand supported on the semicircular lifting plate. The inner section of the pattern then was withdrawn laterally after which the crane was hooked onto the main core as shown to the right in Fig. 4. After the large core had been removed, the remainder of the pattern was taken out and the mold was finished, blacked and dried.

After the mold was reassembled, loamed plates were laid vertically up against the facing flanges. The plate at each end was provided with openings corresponding with similar openings in a vertical row of gate cores rammed up in the sand employed for backing the plates. This practice was arrived at after successful experimental tests.

To facilitate lifting this and other castings of a somewhat similar character, two heavy chains are buried in the sand bed under the pattern. The ends of the chain are carried up and supported near the top of the pit casing. After the casting has cooled sufficiently the crane, or if necessary, two cranes are hooked to the chains and the casting with all the adhering sand is lifted bodily out of the pit. As stated previously the outside of the mold is formed from dry sand cores and those that do not adhere to the casting easily are removed afterward. This method of lifting the casting does away with a vast amount of shoveling, especially where several castings are to be made in the same pit, consequently greatly faciliting the handling of the castings and increasing the speed of production.

Tests May Give Data of Practical Value

The United States bureau of mines states that through its investigations into the reactions taking place at certain zones in the blast furnace, the effect and elimination of sulphur in coke and the use of oxygenated or enriched blast it hopes to reach definite conclusions which will be of considerable benefit to the iron and steel industry.

At its Minneapolis experiment station the bureau has made several smelting campaigns, these including the regular sampling and determination of gases at fixed planes in the blast furnace, from which certain deductions can be made. Another run is under way. Trials are also being made with oxygenated blast. The behavior and elimination of sulphur in coke is being studied at the bureau's Pittsburgh station, this revealing some interesting facts regarding the absorption of sulphur by the iron sponge inside the furnace.

The possibilities of using oxygenated blast include the elimination of hot stoves, the use of an excess of coke to prevent chilling and freezing, the elimination of sulphur, allowance of the utilization of high phosphorus ores, improvement in bessemerizing and lower costs. A committee of 10 metallurgists, chemists, and engineers, including five bureau men, is studying this phase, and will shortly issue a preliminary statement.

To Study Use of Liquid Oxygen in Blasting

Liquid oxygen explosives may be used to advantage in lessening blasting costs in iron, salt and other mineral mines and quarries, states the federal bureau of mines, Washington, following a preliminary investigation, which will be broadened after July 1 when a congressional appropriation of $15,000 for this purpose will be available. In destroying the French steel plants in the last days of the war and in mining iron ore in the Lorraine district the Germans used liquid oxygen. In gaseous and dusty coal mines, this kind of explosive is not suitable, although modifications may remedy this. The use of liquid oxygen explosive requires the installation of a local plant involving a large first cost. In operating it, the chief expense is power.

The campaign begun three years ago by the United States bureau of mines, in co-operation with natural gas companies throughout the country to reduce the waste of natural gas, has already succeeded in decreasing the waste of this natural fuel by two-thirds, declares W. L. Powers, formerly of the mine bureau.

Promoting Industrial Education

Efforts of National Association of Manufacturers Resulting in Larger Number of Establishments Training Their Own Workers—Practical Work Done To Assist Members—Make Plan To Fit the Shop

BY HAROLD C. SMITH

FOR many years the National Metal Trades association has taken an active interest in industrial training. One of its early efforts was at the Winona Technical institute at Indianapolis, where the association in conjunction with its Indianapolis members completely equipped a machine shop and voted financial support to the institution for its maintenance. A committee also was appointed to co-operate with the officers of the institute. Later when the school system of Indianapolis took over this institute and started the present Arsenal Technical High Schools, the equipment was transferred to it as a nucleus at that school, from which the present extensive system of shops for vocational and technical education has grown.

As far back as the year 1906, in co-operation with the University of Cincinnati, under the direction of Prof. Herman Schneider, members of our association opened their shops to students in the university's co-operative course in engineering and this arrangement is still continuing. As a result facilities are open to young men to acquire a practical shop training combined with an engineering education.

The year 1911 found the association actively supporting the efforts of the National Association for the Promotion of Industrial Education in working for the passage of the Smith-Hughes bill granting federal aid for vocational education.

Committee Is Appointed

A great impetus was given this work among our members as the direct results of the address entitled "An Abundance of Efficient, well Paid Labor—How to Get It," delivered by H. E. Miles, chairman of the section of industrial training for the war emergency, advisory commission, council of national defense, at our nineteenth annual convention in April, 1918. A demand arose among those present for a systematic campaign to further intensive industrial training. Accordingly, a committee was appointed for this purpose, the basic idea being to interest a greater number of men in the machine industry and to increase the efficiency of those already in it, wherever this seemed necessary. Our present department of industrial education has grown from these beginnings.

While the signing of the armistice seemed for the moment to obscure the urgent need for intensive training, it soon became evident that industry could not afford to ignore the continued need for it in the competitive days of peace. This was amply confirmed when the committee made a tour to inspect the plans of a number of representative members. It soon became evident that to make real progress, it would be unwise to rely soley upon the efforts of the individual members of the committee, who could devote only a small portion of time to a subject which demanded a trained specialist, and therefore they unanimously recommended to the executive committee that the responsibility for carrying on this work should be placed upon a man especially qualified to undertake it, whose duty would be to call upon the individual members and make a study of the individual plants as a preliminary to offering recommendations for the introduction of some system of training. This recommendation was acted upon immediately and in July, 1919, Philip C. Molter was appointed superintendent of the department of industrial education and he has carried on the work since that time.

Five General Plans Proposed

In the course of its studies, the committee found that the training of workers is now being carried on under five general plans, each of which has its place in industry. The field man, depending upon the conditions found at the plant under investigation, recommends one of these five plans, and in some instances, a combination of several of them. These five plans may be designated as follows:

1. Instruction by foreman.
2. Co-operative and continuation schools.
3. Special training in plant.
4. Vestibule schools.
5. Apprenticeship.

Instruction by foreman: This is the system universally employed and consists of putting the workmen directly into the department, under the supervision of the foreman in charge, who is entirely responsible for their success or failure. Our committee finds that the particular objection to this method is that the foreman being responsible for the output of his department has in many instances neither the time nor the patience to properly instruct the worker, and in many cases lacks the ability to impart his knowledge. Also, that lack of sympathy with the training idea or even personal prejudice may militate against thorough instruction, the result being low efficiency and loss to both the employer and the workman.

The co-operative and continuation schools have for their object the manual and technical training of boys and young men in a particular craft or trade which they may select. By this form of education the boy is able to earn money throughout his school course and is enabled to obtain an education, whereas without such an opportunity many would be compelled to quit school entirely. It has an advantage in that it requires

Manufacturers Show More Interest

AN INCREASE of 162 per cent is reported in the number of members of the National Association of Manufacturers who have adopted some form of apprentice training in the past year. The increase in the number of those members who have provided some form of training for specialists is 378 per cent, and in the number of those to provide training for foremen, 240 per cent. These facts were brought out in the paper presented by Harold C. Smith, president, Illinois Tool Co., Chicago, at the twenty-eighth annual convention of the association in New York, May 14-16 and reflect the growing interest in the training of workers. Mr. Smith is chairman of the industrial training committee of the association, and his account of how it is promoting this work was one of the features of the convention.

no additional expenditure or teaching force, with the exception of one supervisor to aid in co-ordinating the efforts of the industries and the public schools.

Education Mandatory

Compulsory attendance at continuation schools by permit workers also has made rapid strides, the majority of states now having legislation making this form of education mandatory. Our committee feels that these forms of education are desirable and most earnestly asks the interest of manufacturers in such schools in order that they may be made most practicable and kept free from political influence. Of course, these schools being under public supervision cannot be expected to convey confidence in the intentions and policies of any particular company. This is the responsibility of the management of the plant itself, and provided those who govern industry can be awakened to their duties this important step will not be overlooked.

Special training in plant: This system, which consists of training in the department by a general instructor, has some of the advantages of the vestibule school and, in our opinion, is preferable to instruction by foremen. It is particularly applicable in shops whose equipment consists mostly of large tools which cannot be isolated.

Vestibule school: This plan came into prominence during the war. As the name implies, it is intended as as the worker's entrance to the factory. While by no means supplanting apprenticeship, it is adaptable in some form in most shops, and properly managed goes far toward relieving the shortage of skilled labor. It has been applied very succesfully to the intensive training of workers for repetition processes and also has been used to train specialists. Where this form of training is used all accepted applicants are sent to the school, where their fitness or unfitness is readily determined. The length of time to be spent in the school depends upon the skill of the applicants, his adaptability, and the character of the work he is to be taught. Our committee finds that the training time varies from three days to three months.

Apprenticeship: Apprenticeship is particularly designed to take care of young men who wish to learn a trade in all its branches, but is not generally adaptable to the instruction and upgrading of unskilled workers. Our committee finds that while there has been a lull in apprenticeship training, partially as a result of conditions brought about by the war, this has been due also in a large measure to the unattractive conditions of the indentures. To remedy this, the committee developed plans for apprentice training which were submitted to and adopted as basic practice by the National Metal Trades association at the annual convention of 1922. We believe this plan wherever installed is sufficiently attractive to secure and hold desirable boys and young men. The details of the plan can be found in our manual, "Apprenticeship in the Metal Trades," which is now in its third edition, due to the demand for copies from members and nonmembers, public school authorities and educators generally.

It is worthy of mention that the National Metal Trades association was the pioneer in this country in the work of industrial training in an organized and practical way as an association project, our officers having realized that the duty of furnishing proper industrial education, and along with it the necessary collateral studies for young people, will devolve sooner or later upon industry itself. Today there are several other associations undertaking a similar work. It is the belief of the committee that in the majority of instances shops with 100 or more employes should consider seriously the establishment of a training department.

No One System Recommended

While the individual members of our committee have a preference for certain methods of training within their own establishments, the committee as a whole has not reached the point where it recommends any one system of training as applicable to all plants. In view of the size of our membership, the differing production methods, the vast territory covered and the changing conditions in industry, the futility of recommending any one system can readily be seen. The following observations, we believe, generally apply:

1. Comparatively few men have the faculty to impart knowledge to others. Often the best workman is the poorest instructor. Hence it is preferable in most cases to engage a competent man to assume this work.
2. Even though the foreman happens to be a good teacher he is in most instances too occupied with important production problems to devote proper attention to beginners.
3. The average foreman, due probably to the press of other matters, lacks the necessary patience and sometimes the human insight for instructing the beginner. He may also consider himself too high grade an executive to be assigned to such work.
4. Unless the schooling is centralized the company cannot readily carry out a fixed policy with regard to teaching subjects pertaining to honesty of product, citizenship, pride in good workmanship and loyalty.
5. The influence on the future attitude of learners toward each other and toward industry depends largely on the impression made on them at the start. This should be borne in mind constantly.
6. In a school the beginner is sure of a variety of work, whereas the tendency in the shop is to give him such a quantity of simple work that he will not need the attention of the foreman for some time.

Each plant should be considered individually, bearing in mind the product manufactured, the varying degrees of skill and intelligence required, the number of workers employed, the plant organization, the labor turnover, the method of recruiting new workers, the system, if any, of training already in use, the prevailing wage plan, the plant spirit, local conditions, as well as other factors having a direct bearing on the question of training and education for the individual plant.

Give Common Sense Education

While the primary objective is to develop manual dexterity in the work too much stress cannot be laid upon the need for supplementing this by a common sense education, as well as to convey to the worker the real policy of the employer. This latter must be done by the employer himself or by his authorized representative.

With something like 700,000 children annually leaving school at about the seventh grade, and the discipline and the teaching of practical things of life diminishing day by day, it is inevitable that a great responsibility for the real education of the mass of people in this country lies with the business corporation. Frequent complaints are heard that the workman of today lacks respect for property. I believe the remedy for this lies with ourselves along the lines just indicated.

The success which our own organization has had with this work is, I believe, the best possible proof of its value. Beginning in 1922, a request was made for a report on the question of training within the association. Replies from 59 per cent of the membership showed that 146 trained apprentices, 72 trained operators or specialists and 68 trained foreman. This year a similar reply from about the same number of members showed an increase of 162 per cent in apprentice

(*Continued on Page* 1760)

Significance in Ore Distribution

Minerals Inventories of World Now Among Handbooks of Diplomacy—Their Location Certain To Force Co-operation Among Nations—A Descriptive Analysis, with Particular Reference to Lake Superior Deposits, Most Important of All

BY R. C. ALLEN

WHEN we ask the elemental question, "What is iron ore?," we find that we are unable to give a satisfactory definition in the commercial sense until we have analyzed the economic conditions which determine for any deposit of iron bearing rock its usability or its nonusability for the manufacture of iron. That the mineral hematite (Fe_2O_3) is an ore of iron is true from a mineralogical point of view. Magnetite (Fe_3O_4), and siderite ($FeCO_3$) are in the same sense ores of iron. But there are vast deposits of these minerals that are not iron ore in the commercial sense.

There are in the Lake Superior region billions of tons of easily minable rock containing 30 to 40 per cent of metallic iron in the form of hematite that is *not* iron ore. It is not iron ore for one reason, because there are in the same region hundreds of millions of tons of similar rock, also easily minable, containing 50 to 68 per cent of metallic iron, and from which iron can be much more cheaply made.

The cost of producing a ton of iron ore is, say, $2 per ton on board cars at the mine. It will cost $3 more to move that ton of ore to the Pennsylvania furnaces where its cost is $5. If the ore contained 50 per cent metallic iron, its cost would be 10 cents per unit. If it contained only 40 per cent of metallic iron its cost would be 12½ cents per unit of iron. Furthermore, it would take more coke and limestone to smelt it.

The use of the 40 per cent ore instead of the 50 per cent ore would also cut down the daily yield of the blast furnace. There would be produced more slag and less iron. From this simple statement it is obvious that the richer iron-bearing rocks of the Lake Superior region will be used first and that so long as 50 per cent ores are available the 35 per cent rock is unavailable, that is to say, it is not iron ore.

Neither, we think, would 35 per cent rock be iron ore in the lake region if richer material did not exist there. In that event there would be a movement of furnaces now using rich lake ores to the Atlantic seaboard, and in them would be smelted foreign ores supplemented by the iron ores of the western states. There would also be a much larger development of the ores of the Birmingham, Ala., district and similar ores northeastward along the Appalachian region, for although these ores carry only 30 to 35 per cent of iron, they occur in close relation to limestone and coking coal and the transportation cost of assemblage of these raw materials for iron manufacture is in this region correspondingly low.

At present Lake Superior iron ores absorb the markets in the entire region of the Great Lakes and the territory southward east of the Mississippi river, including the Ohio river valley. In the Appalachian and eastern districts including the Virginias and northward the lake ores are extensively used, but imported and local ores also are available. South of the Virginias and the Ohio river valley the Clinton iron ores, which are worked so extensively at Birmingham, and scattered small deposits of other ores, are used. West of the Mississippi river practically the only iron making is carried on at Pueblo, the materials being assembled from points in Colorado and Wyoming.

Other Countries Affect Availability

The availability of the iron ores in the deposits of the United States is affected by the iron ore deposits of other countries. We need, therefore, to consider the subject on a world basis. Take a map of the world, study the coal fields and the iron ore deposits and locate upon the map the fields of coking coal and iron ore, and the blast furnaces. You will find that, making due allowance for densities of population and the relative industrial advancement of the different peoples, blast furnaces are clustered in those areas where iron ore and coke can be most cheaply assembled. You will see that the southern hemisphere has a great deal of iron ore but relatively little coal and that areas of almost continental size are devoid of coal.

Consider South America. Brazil has in the province of Minas Geraes, 300 miles from the seacoast, probably the richest and largest deposits of iron ore in the world. But Brazil lacks coal and her iron ores remain unused. Chili, like Brazil, has vast deposits of rich iron ore and lacks coal, but the Chilean ores, more fortunately, lie on the very fringe of the sea and because ocean transport is cheap they are available for use on our Atlantic seaboard, in competition with the ores of Lake Superior.

In Europe you will note hundreds of blast furnaces in the area where the borders of Germany, Belgium and France meet. Here is the great ore field of Luxemburg and Lorraine and here are the great coal fields of Westphalia, the Sarre basin, Valenciennes, Namur and Liege. You will discover the industrial strength of England in her matchless high grade coals and her ores of iron. The "Yellow Peril" will have a new meaning when you see that nearly one-quarter of the world's coal is in China, together with considerable reserves of the ores of iron.

We see, then, that the availability of a deposit of iron ore depends on many things, its richness, ease of mining, nearness to coking coal and dense populations, transportation facilities and the state of industrial development of the country in which it occurs. Other factors have to do with the ore itself.

All ores of iron contain in addition to iron other elements that must be eliminated in the manufacture of iron and steel. If an ore has as much as 2 per cent of sulphur, it is worthless; if as much as 0.25 per cent of phosphorus its use in this country is limited; if too much moisture, it won't do for a long rail haul. A trace of titanium renders an ore unavailable. If its physical structure is bad, producing losses in transportation or reduction in the furnace, or trouble in handling, it is undesirable. The relative amounts of acids (silicon and aluminum) and bases (calcium and magnesium) are also of importance.

We are now ready for a definition of iron ore. Iron ore is rock which can be moved from its natural position in the earth and used in the manufacture of iron with profit. With this definition in mind we may consider briefly the origin of iron ores. Iron is one of the commonest of the elements, one of the eight out of 70 or more which together comprise 98 per cent of the weight of the earth, one of the four that together comprise 87 per cent of the earth's mass. These four are oxygen, silicon, aluminum and iron

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From an address to the Associated Technical Societies of Cleveland, Cleveland, Jan. 16. The author is vice president, Lake Superior Iron Ore association, and is associated with Oglebay, Norton & Co., Cleveland.

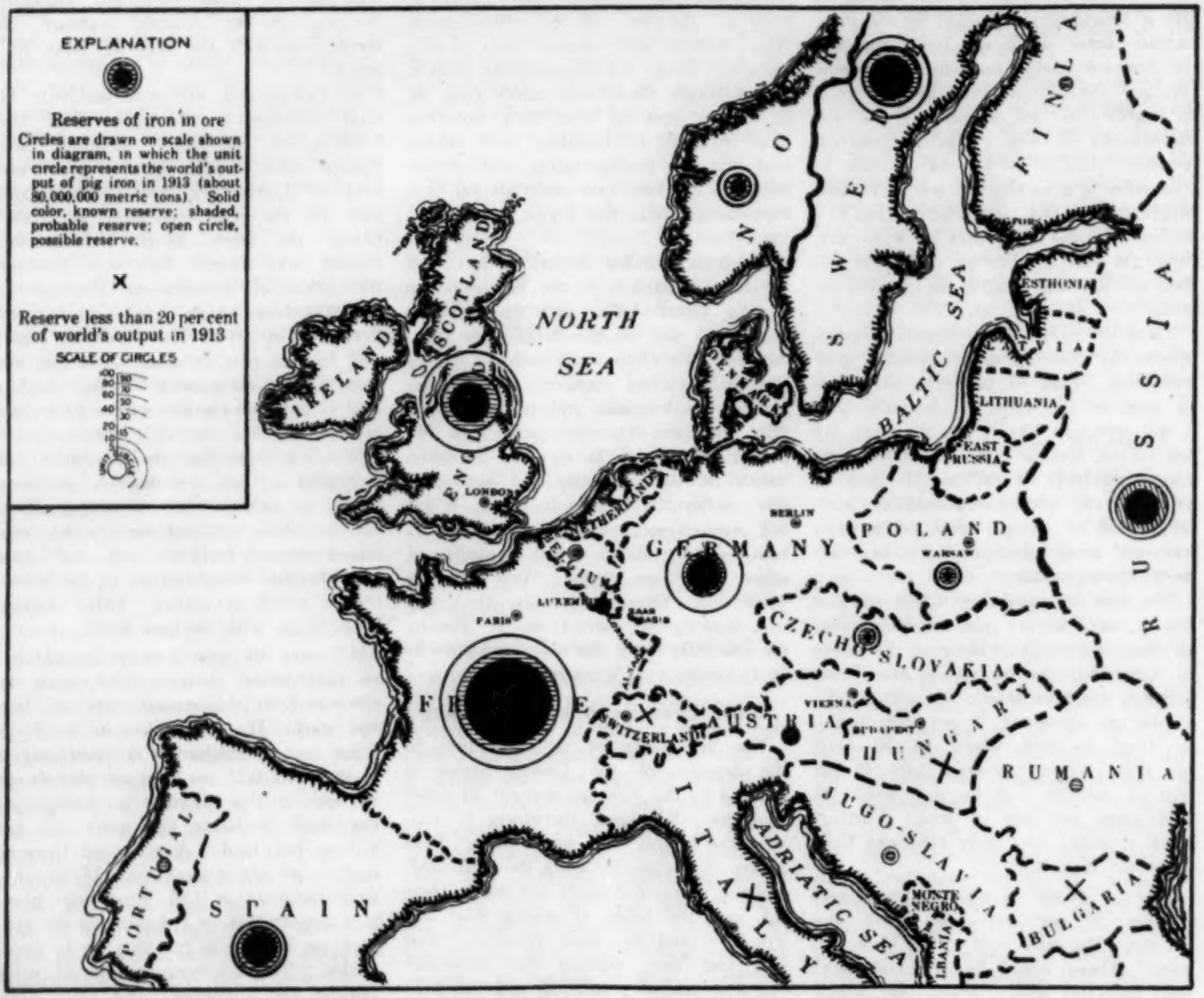
named in the order of their abundance.

Clarke has shown that this planet contains 4.64 per cent by weight of iron. It exists in some amount in all of the rocks. It is everywhere present but nowhere in nature in the native or metallic form, with the exception of a stray meteorite found now and then—wanderer from the starry spaces. In the rocks which formed the surface of the original earth, iron was much more evenly distributed than it is in those forming the outer shell of the present earth. With the exception of some deposits of magnetite (Fe_3O_4, Fe, 78 per cent), relatively unimportant, the original rocks do not contain ores of iron. These rocks are igneous, that is to say, they have crystallized from molten rock material. From them all other rocks have been formed directly or indirectly. These are the secondary or sedimentary rocks. The common ones are conglomerate, shale, sandstone, and limestone.

The sedimentary rocks contain the record of the beginning and development of plant and animal life on the earth, the oscillations of the ocean strand, i. e., the advances and retreats of the seas across the continental segments of the earth, the alternating submergences and emergences of the lands, the building of mountain ranges and their degradation by erosion; in short, the whole train of physical and climatic changes to which the earth has been subject since far back in the history of the planet. We cannot here discuss the formation of the sedimentary rocks. Suffice it to say that the process has been one of physical and chemical dissolution of the original igneous surface of the earth and a redistribution of the materials, most of which are in the relatively thin mantle of sedimentary rocks covering the major portion of the continental areas.

The sorting and segregation of materials comprising the complex igneous rocks by those processes resulting in the sedimentary rocks is illustrated in thick beds of sandstone composed almost entirely of silica, of limestone composed mainly of carbonate of lime, of common salt, the great iron-bearing formations of present interest, etc.

The concentration of iron to form the so-called iron-bearing formations has taken place at various times in geological history. To these original concentrations and in part to later additional concentration within the iron-bearing beds we are indebted to probably 95 per cent of the presently available iron ores of the world. Among the oldest sedimentary rocks of which we have knowledge, known in the Lake Superior region as the Keewatin Series, are extensive iron-bearing beds. The iron ores of the Vermillion range of Minnesota are in the Keewatin Series. But the great productive beds of this region are considerably younger. They occur in the Huronian Series and contain the iron ores of the Mesabi and Cuyuna ranges in Minnesota and the Gogebic, Menominee and Marquette ranges of Michigan. A short while ago it was believed that



RESERVES OF IRON ORE IN EUROPE

This map forms part of the exhibits contained in the work "The Iron Ore Resources of Europe," published by the United States geological survey, from data prepared for use by the American commission to negotiate peace. All estimates were given on a basis of the actual units of iron in the ore, and they are here presented on a proportional scale.

these formations antedate the appearance of life on the earth but it is now known that lowly forms of sea life existed at that time, for fossil algae are found in the limestones of this series.

All things considered, the iron-bearing formations of the Lake Superior region contain the world's most important deposits of iron ore. From them are produced about 86 per cent of the output of the United States and about 40 per cent of the iron ore of the world. About 99 per cent of this production is in the United States and 1 per cent in Canada.

Deposits and Formations Different

The iron ore deposits must not be confused with the iron formations that contain them. The latter are great sheets of rock from 100 to 1000 feet thick, originally extending as flat sheets over many hundreds of square miles. They exist now only as remnants. With other rocks with which they are associated they have been intruded by sheets of igneous rock, twisted, folded, and uplifted in mountain ranges. These ancient mountains were worn away by erosion many millions of years ago and we see today only their leveled stumps in which only the edges of the iron formations appear at the surface. It is these linear and curving belts of iron formation that suggested the term "iron range." It was during the period of degradation of these ancient mountains that the iron ores were formed.

The iron formation in its original condition contains no iron ores in the commercial sense. It has on the average about 25 per cent of metallic iron. The iron is in the form of iron oxide, iron silicate and iron carbonates. Nearly all the other 75 per cent is silicon and oxygen. Silica and the simple iron minerals just referred to comprise probably 95 per cent of the iron formations.

The formation of ores is a simple process. It involves the thorough oxidation of the iron minerals and the extraction of the main portion of the silica. This is accomplished by ordinary ground waters, oxygen bearing waters from the surface. Silica is soluble in ground water but iron oxide is not. The iron oxide remains in place, silica is dissolved and carried away. Wherever this process is sufficiently complete iron ores are formed. It follows, therefore, that the iron ores are to be sought for in the trunk channels of downward moving waters. It is the business of the geologist to locate such places.

Time does not permit reference to the various structural situations giving rise to such concentrated movement of water. It is enough to say that in them ores occur and, without them, generally speaking, ores are not found. There are some unimportant exceptions to this rule. I do not refer to present conditions of water movement but to those existing when the ores were being concentrated. For we find that the ores occur far below the region of active present circulation. At the present time the water table stands everywhere in the lake region very near the surface. When the ores were formed it stood far below the then existing surface, perhaps several thousand feet below it. It is difficult to account otherwise for the existence of great ore bodies more than 3000 feet below the present ground water table.

I have referred briefly of the origin of Lake Superior iron ores. In its main outlines it will serve for some other districts as well, yet each district has a story of its own. The great deposits of Brazil, for instance, which are as ancient as the Lake Superior ores, unlike them, seem to have been originally deposited as sedimentary rock in almost the precise condition in which we now find them. There has been little secondary enrichment of the Brazil ores by the action of ground water without which there would be very little mining in the Lake Superior region. The same is probably true of the Clinton ores of Birmingham, the Appalachian region and Newfoundland, and the Lorraine-Luxemburg field of Europe. The ores commonly associated with the coal measures the world over, the bog ores of modern swamps, the residual ores exemplified in North Cuba, the brown ores scattered widely over the world, the magnetite ores, all of these would merit attention in any but the most cursory discussion of the origin of iron ores.

Consider now the importance of iron ore in modern civilization. So dependent are we on the utilization of iron that we are quite unable to construct in imagination what the organization of modern society would be without it. But in this connection we shall have to consider also coal, the handmaiden of iron ore. The one is the complement of the other. Of all the treasures of the earth the most precious are these. With coal and iron are wrought the sinews of empire. Those nations who are blessed with an abundance of both will dominate the world. Those which lack either are vulnerable in war; those which want both are impotent.

Supremacy Founded on Coal and Iron

Industrial and military supremacy are founded on coal and iron. Bismarck understood this. By the Franco-Prussian war of 1871 he robbed France of her then most important reserves of iron, and with them united to the great Westphalian field of coking coal near at hand on the German side of that historic border laid the basis of the succeeding phenomenal development of the German Empire.

If Bismarck and his advisers had understood the geology of the Lorraine ore fields the German border would have been drawn a little farther South. As it was, he left to France the means of recovery of her industrial strength, without which she would have been overwhelmed in the Great War, despite the aid of her powerful allies. By mistake Bismarck left to France two-thirds of the most important ore field of Europe. By the treaty of Versailles, France recovered what she lost in 1871. But the great Westphalian coal field, the complement of the Lorraine ores, remains in Germany. In this circumstance lies future as well as present trouble. In the end the economic conditions are bound to override historical and political considerations and we may expect that the difficulties between these two countries will not be finally resolved until the coal and the iron ore of this border land are comprehended under one government.

Minerals An International Problem

So we find that a consideration of the coal and the iron of the Franco-German border lands leads us at once into the realm of international politics. That's where one lands eventually in the consideration of any one of the essential minerals of industry on a world basis. The explanation is simple. Consider the industrial foundation of this city (Cleveland), Cuyahoga county is a great industrial center but should it have to depend on its own supplies of raw materials it would not be. It produces an insignificant number and quantity of the raw materials that feed its industries. The state of Ohio is more nearly self-sufficing than Cuyahoga county. It has coal, oil, gas, iron ore and many nonmetallic products like shale, gypsum and clay. But Ohio has no ores of copper, zinc, lead, gold, silver, tin and many other metals necessary to its industries. The United States is more nearly self-sufficing than the state of Ohio, but even this great country lacks many of the minerals essential to the maintenance of its power in war and the convenience and comfort of its people in peace.

Even the greatest of its industries, steel, must draw on Canada for nickel, Peru for vanadium, Russia and Brazil and Ceylon for manganese, Malaysia for tin, etc. It is a caprice of nature that put the world's supply of mineral potash in Germany, nickel in Canada and New Caledonia, tin in Cornwall and Malaysia, platinum in Russia and Colombia, nitrates in Chile and the South Pacific islands, sulphur in Sicily, Japan and the United States; that gave China and the United States 70 per cent of the world's coal and none at all to Norway, Sweden, Switzerland, and many other countries, forgetting many of those in the southern hemisphere almost entirely.

If purpose may be imputed to nature, it would seem that one is revealed in this haphazard distribution of the essential minerals of industry. Nature has made it necessary for the peoples of the earth

to co-operate in the interest of a higher civilization. Even to maintain the present civilization of the world, co-operation is not only desirable but necessary. Eventually, we think, nature will have her way about it. Postwar thought on these matters gives some basis for that hope, distant though its realization undoubtedly is. I understand that an influential group of Americans attending the peace conference in Paris seriously espoused a scheme that would require the pooling of every nation's export surplus of ores and metals for distribution to the world under the authority of the league of nations. This is, of course, chimerical but that it could have been seriously advocated by leading thinkers is significant. We see hope in the fact that international co-operation on a world scale in the production, movement and utilization of essential raw materials, especially minerals, was demonstrated to be feasible in the recent war.

World Co-operation Essential

What the nations can do, driven by fear and necessity, they will perhaps some day learn to do in peace and tranquility. Eventually, the civilized nations will either solve the problems imposed upon the world by the unequal distribution of the treasures of the earth or, failing, perish fighting for them.

Whatever may have been the occasion for the Great War, few today are ignorant of its fundamental cause. Germany, by her own admission, fought for a place in the sun. She desired readier access to the raw materials necessary for her industries. Her defeat has not settled anything, it has not even put an end to the war. The recent war was on long prior to 1914 and is still on. The years 1914 to 1918 witnessed merely a violent phase of the war. The scenes of the main struggles have shifted somewhat but the nations who survive without total disability are still fighting for the treasures of the earth.

The war continues but the fighting is done under a different set of rules, diplomacy is substituted for blows, intrigue for open battle, tariffs and trade regulations for blockades, peaceful penetration for invasion. Japan reaches for the coal and iron of China. England must have the oil of Persia, and divides with the Dutch the oil of the East Indies. Mexico struggles desperately with her foreign concessionnaires. Even the United States is not indifferent to the disposition of those oil wells at Mosul, Russia holds the oil of the Caucasus as a pawn on the international chessboard.

The game is played with a desperation hardly known in antebellum time. Each warring nation by experience and each neutral nation by observation has had brought home to it its vital weaknesses and is seeking to repair them. The methods are territorial encroachment, political control of weaker peoples, commercial penetration, trade laws and tariffs, ship subsidies, mandatories, and financial control of great corporations in international trade.

The face of the earth is being scrutinized as it never before has been. The great powers, particularly the United States, Great Britain, France and Japan, are busily inventorying the natural wealth of the world. These inventories are among the handbooks of postwar diplomacy. In them are the mainsprings of foreign policies. If, therefore, we would understand the moves in the game of international politics, let us study the face of the earth.

Another fruitful source of international political difficulties, is presented by scarcity of certain minerals in relation to world demand. It is a startling fact that more minerals have been consumed in the last century than in all prior history of the world and it is to be expected that if the present rate of accelerated production continues, that the supplies of certain of the essential minerals will fail to meet requirements. The mineral deposits are being drawn upon for about 2,000,000,000 tons per year, those of the United States alone for 900,000,000 tons, almost half the world's total. Coal and iron ore together comprise nearly 80 per cent of this, oil 4 per cent, copper 3 per cent, all the other mineral products combined only 13 per cent. Of coal, since 1905 more has been consumed than in all preceding time, of iron ore since 1906, of oil since 1908.

The United States soon will begin to feel a shortage of oil. We have produced about two-thirds of the total oil of the world. That is why we have today only one-seventh of the world's oil reserves. We need free access to foreign oil fields and we seek in other countries the open door that we have extended to all the world. Neither are we self-sufficing with respect to our raw supplies for steelmaking. Of the ferroalloy minerals, which have an importance out of all proportion to the quantities used, our supplies of chromite, manganese, tungsten and vanadium are inadequate; of nickel and cobalt we have practically none. Tin, so important to our tin plate industry does not occur in this country.

It often has been remarked that engineers as a class take little interest in questions of social and political importance, that their influence on governmental policy is in consequence negligible. But the engineers are awakening to their duty and opportunity as leaders, not only in the technique of industry but also in its equally important social and political aspects.

Let him discover what are those treasures of the rocks so essential to our civilization, where they are, who owns them, what are their uses, where they are required and their means of exploitation and transportation. He will be then more able to understand the course of modern diplomacy, its actuating impulses, and out of this understanding will make his voice and influence felt on the foreign and domestic policies of his own country. For the war taught us that we are citizens of the world henceforth in a different sense than we had supposed.

We no longer can discuss any important question on a provincial basis. We need breadth of information and enlarged vision. On these, co-operation may be founded. We have learned to co-operate as individuals in our various undertakings; we co-operate in business; small units unite to form greater units—this is the modern co-operation. During the war great corporations co-operated with our government and our government co-operated with other governments. What the nations learned to do in this regard under stress of war they must some day do to maintain peace in the world. Nothing seems to me more obvious than this: The nations will either find some method of accommodation, some means of co-operation in the use and distribution of the essential resources of the earth, or go down fighting for them.

Testing Laboratory Uses High Voltages

Electrical tests of machines at voltages ranging upward of 1,000,000 volts were demonstrated at the formal opening of a new high voltage testing laboratory at the Trafford City, Pa., works of the Westinghouse Electric & Mfg. Co. recently. It is said to be the first time that these high voltages have been used for testing power apparatus. The laboratory was necessitated by the increase of voltages used on transmission lines for supplying electricity generated by hydroelectric plants at waterfalls.

The main laboratory, having a floor space 110 x 120 feet and isolated from nearby buildings, is equipped with two testing transformers, one for 1,000,000 volts and the other for 500,000 volts. In addition, two large oil tanks with auxiliaries are provided, one for tests for insulation under oil and the other for rain tests of bushings and similar apparatus. The building is so constructed that a clear space of 50 feet exists from the floor to the lower chords of the truss, giving an unobstructed volume 110 x 120 x 50 feet and affording plenty of clearance for the high potentials used. Attached to one side of the main building and partly separated from it by a glass partition is the operating control building. On the ground floor of this structure the generating equipment, low-voltage switchboards and workshop are installed. On the upper floor are the two transformer operating booths, remote breaker control bench and the office.

Ferroalloy Furnace Is Improved

Experimental Work Indicates Efficiency of Power Input Is Affected by the Design of Leads—Principles of Keeping Load Factor of Operation Close to 100 Per Cent Are Discussed

BY B. D. SAKLATWALLA AND A. N. ANDERSON

ALL metallurgical furnace operations can be divided into two general classes, one consisting of reducing ores by means of a reducing agent, commonly carbon, and the other consisting of remelting and refining already reduced metals. The electric furnace has been adapted to both classes of operations. To the latter class belong the steel and brass furnaces, and to the former the ferroalloy furnaces. As the heat energy required for reduction of ores is much greater than that required for the mere melting and refining of metals the ferroalloy furnaces are fed by comparatively much larger amounts of power. Consequently, the structure and arrangement of ferroalloy furnaces have presented interesting problems.

Since the classical experiments of Moissan, more than 30 years ago, to reduce metals in the electric furnace, the application of electrical energy has constantly widened in this field. The furnaces have not only been constructed for a constantly increasing number of products but also have increased in size and power input, so that today furnaces having a 12,000 or even more kilovolt-ampere capacity are operating commercially. Undoubtedly in the United States the Niagara district can be called the cradle of the electric industry. It was there that the carborundum, aluminum, graphite, carbide, and ferroalloy furnaces had their inception and were commercially established by the efforts of such men as Hall, Acheson and Price. From this district, with the development of power projects the use of the ferroalloy furnace spread to other industrial locations.

Scientific Knowledge Lacking

In the early days little was known of the electrical phenomena found in alternating currents of higher than 25-cycle frequency and little attention was given to the purely electrical phases of the problem. To have sufficient conductor cross-section for a predetermined current was practically the only consideration given. The pressure to be employed was arbitrarily chosen. It was considered dangerous to go over 100 volts on a furnace. The control of the arc and bath resistance, and the spacing of electrodes were considered not practical with high voltages. Generally the pressure decided on was between 40 and 80 volts.

As the size of the furnaces and their power inputs increased it was found that the conductors heated up excessively in spite of the fact that the current density was no greater than in the smaller initial installations. Addition of extra copper was helpful but did not effect a cure. The conductors heated up with a density as low as 400 amperes per square inch. Undoubtedly other factors had to be taken into consideration, especially as frequencies higher than 25-cycle had to be encountered. As 60-cycle current became more and more standardized it appeared for a time that furnace energy input at this frequency had reached its limit at 3000 kilovolt-amperes.

Meanwhile alternating current phenomena were being studied and investigated by such men as Steinmetz, Northrup, Carson, Dwight, Roland, Rosa, Grover, and others, especially in reference to skin effect, spacing and shape of leads for heavy duty conductors. The theoretical considerations of skin effect had been studied mainly with reference to currents of high frequency, though undoubtedly this effect is present in heavy conductors carrying large currents at low frequencies. W. C. Kennedy in a paper presented before the Association of Iron and Steel Electrical Engineers in 1917 stated that the resistance loss due to skin effect on a 3750 kilovolt-ampere, 3-phase furnace, at 12,000 amperes per phase, was by actual measurements about 11 volts per lead, the drop without skin effect being 0.15 volt for 10,000 amperes.

Numerous suggestions for cutting down impedance by methods of distribution of current, by proper spacing and dimensioning of bars, looping the circuit, so-called interlacing, etc., were forthcoming and eagerly investigated. However, putting them into actual practice had been deferred. It was, therefore, the desire of the authors to carry out practically these theoretical considerations they were responsible for in the design of ferroalloy furnaces.

It appears to have been common practice for some time to employ tubular conductors for high tension bus structures. However, they do not seem to have found use as conductors for large currents.

Copper Tubes Have Less Skin Effect

It appears to be generally accepted that the skin effect resistance factor of flat strip conductors is less than that of equisectional solid round conductors. This holds good only under certain conditions at commercial frequencies, the effect being influenced by the relative position of parallel conductors, the current values being of opposite sign. All available data indicated that copper tubes would have much less skin effect than equisectional conductors of any other form.

The ideal alternating current installation would have a total impedance equal to that of a direct current installation of equisectional conductors. This would mean that the factors of skin effect, reactance and inductance in alternating current leads must be eliminated. As the elimination or neutralization of all these factors is difficult if not impossible, it follows that the best solution of the problem in a practical installation, would be to use conductors of such shape, spacing and arrangement that the total impedance or alternating current resistance ratio to the direct current resistance would approximate unity.

In the design under consideration, preliminary experiments from a metallurgical standpoint had proved the advisability of high voltages and also high current density. As 220 was a standard pressure it was chosen. To secure high current density graphite was selected as electrode material and the size chosen was 12 inches, the largest commercially available. Keeping the current density on the electrodes at about 100 amperes per square inch, 10,000 to 12,000 amperes could be obtained in each arc

From a paper presented at the Pittsburgh convention of the American Institute of Electrical Engineers, April 24-26. The authors are connected with the Vanadium Corp. of America, Bridgeville, Pa.

which for a 3-phase 3-electrode equipment would represent a total energy of 4000 kilowatts. This was adopted as a standard unit.

Since the prevailing electric furnace practice was to use woven standard conductors or multiple straps in the endeavor to secure increased surface for a given carrying capacity of copper, and since this practice was found to result in considerable resistance loss in the conductors, it was thought that an effort to obtain the relation between factors influencing the passage of a large current through such conductors might point the way to better practice.

Test 8 Types of Conductors

Accordingly a current density of 800 amperes per square inch of copper section was decided on, using conductors 40 feet long. It was decided to investigate mathematically 8 different types of secondary transformer lead construction. The results thus obtained indicated two promising methods, the first consisting of 72 strips of 4 by ⅛ inch copper, interlaced and spaced ⅛ inch apart and the second of 12 copper tubes of 3 inches diameter spaced 7 inches center to center. For the two systems considered, calculated values as tabulated indicate the ratio of the alternating current resistance to the direct current resistance and the total line loss for the tubes to be practically ½ of that of the strips.

The reactance volt drop for all of the systems was then calculated for varying power factors at full load. The 4 by ⅛-inch strip interlaced showed up to much better advantage than the others for power factors of less than 99 per cent. On the other hand, as a preliminary experimental 750 kilowatt furnace was found to operate at a power factor close to unity, it was decided that the same precaution taken to insure a high power factor could be utilized for the 4000 kilowatt unit. Moreover, the indicated reactance volt drop for the interlaced 3-inch tubes would serve as a protection in case of sudden heavy overloads or possible short circuits, which, probably on rare occasions only, are balanced in a 3-phase, 3-electrode system, the greater the state of unbalance the greater being the drop in voltage.

To summarize the tabulated calculations it is found that:

1. The larger the cross-section of the conductor the larger the skin-effect. This effect is appreciable at frequencies of 60 cycles for conductors greater than ½-inch diameter.

2. Skin effect is higher in straps than in tubes of equisectional area with subsequent higher power loss.

3. Distribution of the current over the sectional area of a conductor is not affected by the inductive disposition of the conductor, since the internal inductance is unaffected by the mutual inductances.

4. Inductive reactance may cause considerable voltage drop in the electrode leads.

5. The larger the diameter of the conductors the less the inductance.

6. The farther apart the conductors the larger the inductance.

7. When inductive reactance expressed as per cent reactance drop amounts to 20 per cent or more, the actual volts drop in the line increases rapidly with decreased power factor.

Considering these factors, namely, the calculated voltage drop and line loss, the probable advantage of a progressively increasing voltage drop with decreasing power factor, and the fact that a bus structure of large copper tubing gave promise of a simple and rugged construction, it was decided to install 12 copper tubes of 3-inch diameter, interlaced and spaced 7-inch center to center, fixing the current density at approximately 800 amperes per square inch.

It was necessary to find a transformer so constructed that the secondary terminals could be brought out to allow the installation of the tubes as planned. The one used was wound with two secondary coils per phase, making four terminals per phase and the adjacent leads were brought out plus the minus. In the 12 terminals thus brought out the alternate plus and minus arrangement was continued over the series.

The transformer delivered a 4000-kilovolt-ampere output at 40 degrees Cent. temperature rise and 5000-kilovolt-amperes at a rise of 55 degrees Cent. It was water cooled, 3-phase, 60-cycle having a high-tension voltage of 22,000 and low-tension voltage of 224 volts at no-load which drops to 220 volts at full load with 100 per cent power factor and 209 volts at a power factor of 90 per cent. The actual transformer impedance was 11.3 per cent.

Use Asbestos Cord Cable

Probably the nearest approach to the tubular form of conductor for flexible leads for connecting the movable electrodes to the bus structure is the familiar asbestos cored extra flexible cable developed expressly for furnace operation. Consequently this type of cable of 1,000,000 circular mils diameter was used. There were 16 cables per phase, making 4 cables for each of the 3-inch tubes. The other end of the cable was connected to a 5-inch copper tube, about 8 feet long running across the furnace to the electrode holder. Directly underneath the terminals of the 3-inch tubes, which terminate at different lengths to allow placing of cables, were 3 slabs of slate each drilled with a hole just large enough to pass a cable. The 16 holes per phase thus drilled were in the form of a square, the spacing being such that a 2-inch space remained between each cable. This spacing was maintained throughout the cable length by means of grooved blocks, one block clamping a row of 4 cables on both sides. These blocks also served to prevent swaying motion of the cables without interfering with the up and down motion.

The general scheme of arrangement for adjacent tubes was applied to the cables. The delta connection was formed at the end of the 5-inch tube projecting over the back of the furnace and the cables were so placed that those carrying current of opposite sign were adjacent both with respect to cables in the same square and cables in adjacent squares.

Reduces Impedance Drop

This method of construction with respect to arrangement of the 3-inch transformer lead tubes and the flexible cables resulted in a material reduction of impedance due to alternating current effects since total resistance under full-load tests was increased but slightly over the measured direct current resistance, the excess being less than 2 per cent with phases balanced. The absence of material reactive and inductive influences and of any iron forming magnetic fields in the circuit naturally caused little disturbance in the phase relation between the impressed electromotive force and the current, allowing the system to operate at a high power factor.

Slight unbalancing of current values in the several leads did not affect materially the power factor. Heavy unbalancing power, however, set up impedances at which the power factor was observed to drop below 0.6 and the voltage at the furnace, due to reactive inductance, dropped approximately in accordance with the calculated power factor voltage drop curve.

The phenomena of inductance and reactance were utilized here for the purpose of protecting the complete

electrical equipment against heavy overloads, yet allowing it to operate at maximum efficiency when under control. It may be here pointed out that this effect could have been further augmented by substituting for the 5-inch copper tubes over the furnace roof, a continuation of the interlacing system employed for the cables by extending the cables to the electrode holder, or by means of tubes or strips.

Control Mechanism Sensitive

In order to control and keep up an electrical balance it was essential that the control mechanism employed be sensitive to slight changes in power and rapid restoration of balance. Moreover, for this particular installation on account of metallurgical reasons it was necessary that the effective watt input to the furnace be controlled. Accordingly a control of this type was developed. The principal elements of the control consisted of a watt measuring device and means for reversing rotation of motors to operate the electrodes. The watt element selected was on the principle of the well known Kelvin balance in which the movable or floating element coils received the impressed electromotive force of the circuit and the fixed coils received a current proportional to that in the conductors. Each phase was regulated by its own watt element. The fixed coils were fed from a current transformer on the high-tension side corresponding to its low-tension component. The movable potential coils received their energy from the low tension side of the phase to which they were connected. The circuits operating the reversing switches of the electrode motors were closed and opened by a relay method. The movable coil beam was provided with 2-way contact points placed one above the other connected to a circuit of small amperage, 0.02 ampere taken direct from the low tension lines and energizing magnates placed in the motor switch cabinet.

At a predetermined wattage, obtained by means of a spring calibrated against the pull exerted by the movable coils, the beam floated in balance and out of contact. As soon as any watt fluctuations occurred the beam was inclined and made contact with one of the 2-way points, closing the circuit operating the relay magnet in the switch cabinet. The point at which the beam made contact depended on whether the pull was exerted by the spring overcoming the magnetic pull in event of under load or vice versa for overload. The actuated relay magnet in the switch cabinet closed a circuit energizing another larger coil containing a plunger which lifted contact arms into the path of other contact arms in constant to-and-fro rocking motion. The meeting of the contact arms closed the circuit operating the electrode motors. The motion of the nonrocking arms was controlled by means of fine adjustments which allowed the nonrocking arms to meet the rockers during the desired part of the arc described by them, the speed of the rockers at the same time was variable. The rocking arms also completed the make and break contact of the circuit operating the coils energized from the watt balance, and eliminated unnecessary closing of circuits, which in turn materially decreased the wear on the contacts affected.

Further to facilitate quick regulation and restoration of balance in the furnace a selective regulation device was applied. This consisted of a set of 2-plunger magnets and a lamp in series for each phase, one terminal of each set being connected to its respective phase and the other terminal connected to the furnace. The lamps served as pilot lights visually indicating the relative resistance between electrodes and furnace bath. The plunger magnets, one each for the up and down side of the motor reversing switches were so arranged that a change in current values caused the plungers to change positions from a predetermined neutral point which was adjustable by means of weights. The magnetic field exerted an upward pull on one plunger and a downward pull on the other.

When the furnace load was balanced and resistance under electrodes equal, the plungers were all in the neutral position. A disturbance of potential balance in the furnace between the bath and electrodes causes a corresponding unbalance in the magnet coils and one or the other magnet of each set allowed its plunger to drop. The dropping plunger opened the watt balance relay circuit for the up or down switches, depending on the nature of the disturbance, rendering one or the other of all the motor switch sets inoperative. For example: If the resistance under one of the electrodes suddenly dropped, it caused an increase in the furnace load and set all of the switches to work raising the electrodes. However, as the decreased potential between the bath and the particular electrode causing the trouble decreased the current in the magnet controlling downward motion of the electrode decreased and allowed its plunger to drop thus opening the relay circuit. Since the other magnet in the same set did not pull its plunger down the upward motion of the electrode was left undisturbed and the electrode was raised to restore balance. At the same time the current in the other sets was increased and caused the respective plungers to be pulled down thereby opening the relay circuit controlling the upward motion of the electrodes. This rendered the switches for raising electrodes inoperative except for the electrode which caused the trouble. Reversed condition reversed the operation of the magnets. Thus when one of the electrodes was out of balance this device threw the other two electrodes out of circuit and held them in position while the unbalanced electrode found its adjustment, thereby restoring operating condition in much quicker time. By means of these regulations the period of contact of the arms and duration of circuit closing on the motors was regulated to a great degree of nicety avoiding unnecessary movement of electrodes and wear and tear on the regulating equipment.

Use Automatic Switches

The general arrangement of the electrical equipment consisted of two incoming 3-wire, 3-phase 22,000-volt feeder lines, equipped with lightning arrestors and choke coils, automatic oil switches opening on overload and reverse current. A set of disconnecting switches were placed on each side of the oil switches, the lines feeding parallel into a common set of busses. Each furnace transformer was connected to the bus through disconnecting switches and automatic overload and no-voltage release oil switches. All high tension conductors within the building were of copper tubing. The secondary leads of the transformer were equipped with a set of disconnecting switches operated by hand or motor for deadening the portion of equipment situated in the furnace room, leaving the transformer alive to furnish power for motor drive, etc. The control room, containing all instruments, regulators, relays, etc., was a totally enclosed compartment. All instruments were placed on pedestals and the regulators in cabinets. This allowed ready and easy access to all parts of the wiring and facilitated repairs. The low tension disconnecting switches were operated

from the control room. Switches of the same phase were levered to a common shaft and these shafts extended through the wall to the control room.

Each furnace was equipped with a graphic recording wat.meter, wat.-hour meter, voltmeter, ammeter for each phase and power factor meter. All of the instruments for the first unit installed were of the recording type to facilitate the study of the operation. The control room also contained a frequency meter. The furnaces were regulated either automatically or by hand. All switching, except high and low tension disconnecting switching, was accomplished by means of remote control. An automatic changeover switch was located directly under the control room. This switch served to connect the main factory feeder lines with a live transformer automatically shifting from a dead to a live line. It was operated, when desirable, by remote hand control from the control room. A spare set of regulator switches was provided to be used on either furnace as required. A small auxiliary control room was located in the furnace building. This room contained switches for raising and lowering electrodes, ammeters and voltmeters. It was installed for the convenience of the furnace operators enabling them to change electrodes quickly and other work connected with the operation. While using these switches the main control room was automatically cut out and the motor speed automatically doubled. All high tension leads and equipment were contained in bus structure and partitionel off from the rest. One transformer was placed in a vault, the other being of the outdoor type.

It is highly desirable that an electric furnace operation of this nature be made continuous with interruptions as few and short as possible. With this view in mind facilities for rapid change of furnaces and of electrodes were provided. The furnaces were placed on a double set of rollers at right angles to each other, so that when the furnace needed relining it was rolled out of its position, then rolled aside and a spare one already lined rolled into its place. This method of change was effected in less than two hours time.

Electrode Holder Designed

For the same reason an electrode holder was designed to curtail the time of electrode changes. The holder used worked on the friction-contact principle, eliminating all bolts, nuts or other tightening devices. It consisted essentially of three members; 1, the outer casting of copper, forming a hollow water cooled ring having a slight taper on the inside; 2, a copper ring fitting inside of the water cooled ring and having its outside surface tapered to conform to the inside surface of the first member; 3, bronze wedges fitting between the second member and the electrode. In operation the second member was applied to the electrode by means of the wedges, this taking place on the furnace room floor and the electrode thus provided was lifted with the crane and simply dropped into the first member, making a friction contact by its own weight.

Besides saving time, this device obviated the necessity of loosening or tightening bolts or other devices on top of the furnace where working conditions were disagreeable. Further, should the holder get hot, as the water cooled outer ring and electrode did not expand, the only material that could expand would be the second member ring and the wedges, which would produce a tighter contact, instead of a looser one, as in the case of a holder of the ordinary type. Also, as the electrodes were prepared for service between changes, under agreeable working conditions and at more leisure, it follows that, in preparing the wedges and ring they were properly cleaned and adjusted, insuring good contacts. This holder permits the change of an electrode in 1 to 2 minutes.

This furnace equipment operated at an average power factor of 99 per cent and an overall electrical efficiency for transformer and low tension leads to electrode of 98.5 per cent. Repeated tests made in operation check well with calculated values.

The practical experience and data gathered from this installation indicated the advantage of application of the principles involved to large input furnaces for various metallurgical operations. Also they indicated the feasibility of larger installations probably with twice the power input operating with equal high efficiencies.

Begin National Study of Coal Storage

ANNOUNCEMENT of personnel and plans of the committee which is to direct a national investigation of the storage of coal in co-operation with the United States coal commission, department of commerce and bureau of mines, was made recently by the Federated American Engineering societies. The committee selected was as follows: H. Foster Bain, director of the United States bureau of mines, Washington; David Moffa Myers, former fuel administrator, New York; Parley F. Walker, dean of engineering, University of Kansas; W. H. Hoyt, chief engineer of the Duluth, Missabe & Northern railway, Duluth, Minn.; S. W. Parr, professor of applied chemistry, University of Illinois; Edgar S. Nethercut, secretary of the Western Society of Engineers, Chicago; Roy V. Wright, editor, New York, and chairman W. L. Abbott, chief operating engineer of the Commonwealth Edison Co., Chicago. The first full meeting of the engineering investigating committee was held in Washington, May 25.

The main committee will work with committees in every state, according to Dean Mortimer E. Cooley, University of Michigan, president of the Federated American Engineering societies. They will study local conditions through local engineers in an effort to find a solution for the problems of coal consumers from the smallest households to the largest industries. The investigation, the first of its kind to be undertaken in this country, will deal with the whole range of problems affecting the storage of coal.

Factors involved, according to the societies' statement, comprise cost, embracing the question of financing and providing of means whereby coal in storage may be used as collateral; amounts of coal consumed at different periods, particularly by industries; provision by industrial organizations to aid the workers of the nation in securing coal supplies during the summer at a low cost; methods of handling and storing; effects of storage on the heating value of coal; transportation facilities; allaying labor unrest, and reducing the number of mines and miners.

President Cooley's statement in describing plans for the coal storage investigation, are in part as follows:

"The storage of coal for many years has been looked upon by engineers as an important factor in solving the complex problem of securing for the

consumers an adequate supply of coal when needed and at a price equable to all concerned. No one has specific knowledge of the amount of coal consumed per month, per year. All that is known is the quantity produced by months, and roughly the amount consumed. It follows, therefore, that it is not known whether more coal is consumed for industrial purposes during the summer than during the winter months. It is known, of course, that the domestic consumption is larger.

Data Will Be Complete

"The investigation will bring together in authoritative form all availabel data relating to the influence of the characteristics of each coal upon storage, method of preparing, handling and storing that will reduce to the minimum liability upon spontaneous combustion, effect of storage upon the firing qualities of coal, and reduction in heating value. The study also will disclose, by regions, present storage facilities as well as the quantity of coal that should be stored by Oct. 1 of each year in order to have available during the winter season an ample supply. Methods of financing the storage of coal and the cost as well as the best methods of storing will be carefully studied. An important consideration will be ways and means by which large industrial organizations may make it possible for their employes to secure coal during the summer months at a low price.

"The storage of coal is one of the most important factors in the entire coal industry. If users of coal would more generally make a practice of securing their winter's supply during the spring and summer months, coal production would be materially stabilized and many wastes now incident to coal production eliminated. These reforms would be influential in reducing the restiveness now so marked among coal miners. They would also tend to eliminate inefficient mines and to reduce the number of mines in operation—a thing much to be desired, as a conservative estimate places coal production capacity 50 per cent higher than actually required, provided that the mines work upon a more even schedule. Another effect would be the ultimate release of about 200,000 excess miners in industry.

"Extended practice of coal storage would relieve the transportation problem. Many do not realize that lack of transportation facilities was one of the most significant reasons for the existence of a coal shortage in many localities during the past season. This is a temporary condition but is likely to prevail for some years. It is largely due to the fact that the rate of increase in the amount of coal consumed has been much more rapid than the rate of increase in the facilities for transporting coal. It has been estimated that by 1925 the rate of coal consumption will have reached a point where there will be a shortage of transportation facilities at all times.

"Not only is there a shortage of coal transportation facilities, but the movement of coal during the winter months is much slower and more expensive than during the spring and summer months. To relieve this situation would ultimately result in a lower price of coal to the consuming public.

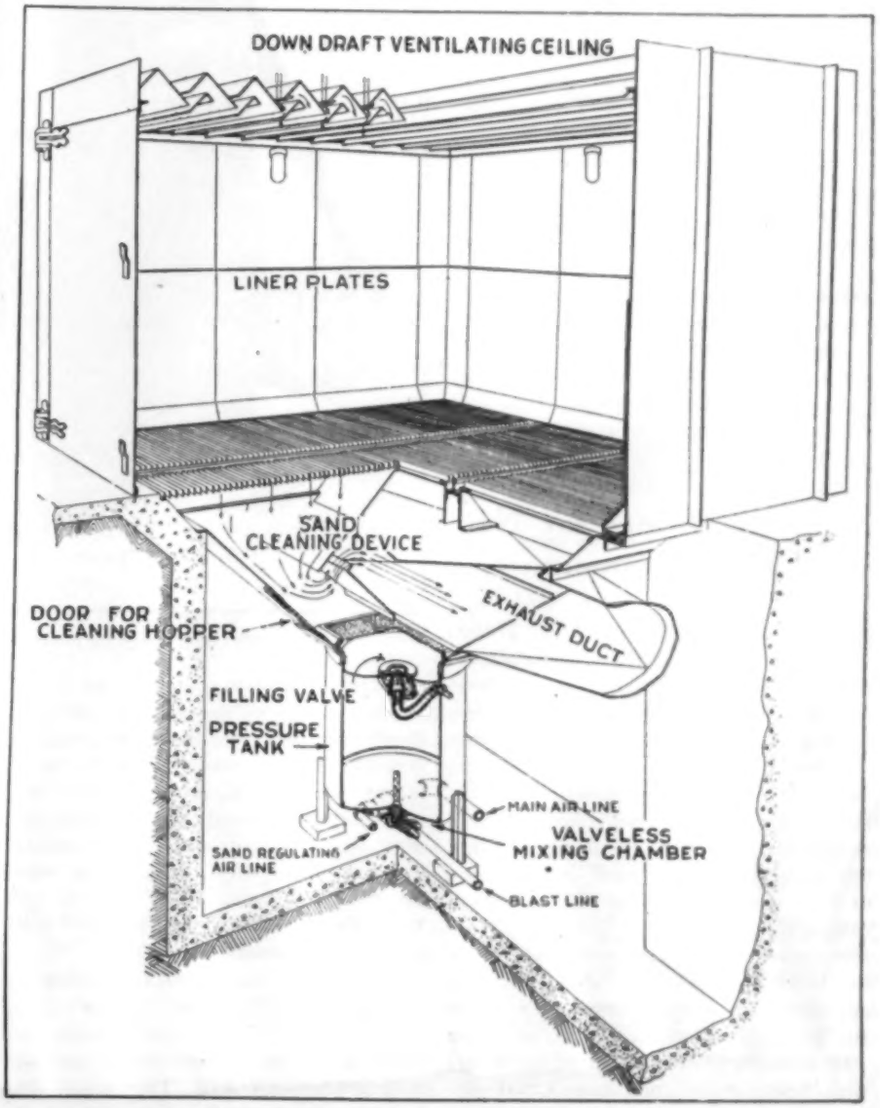
"Therefore, there is involved in the question of an adequate supply, practice of the storage of coal not only the question of an adequate supply, but a real economic and social point of view. The problem of proper and effective storage of coal is vastly different in industrial centers because of local conditions. To embrace all of these conditions, the federation will seek original information from the men who will ultimately judge the value of storage of coal plans that may be derived.

Ventilates Ceiling on Sand Blast Room

The American Foundry Equipment Co., New York, is installing on its down draft sand-blast rooms a recently designed ventilating ceiling as shown in the accompanying illustration. The roof of the room is a system of angles and baffles rigidly tied together and so arranged that the fresh air can enter freely, but no abrasives can shoot and rebound between the baffles. The dust is carried away so that it cannot rise or swirl above and obstruct the operators' view. The dust-laden air passes through the floor gratings and enters a hopper which tapers to a horizontal screen placed just above the pressure tank. Nails, wires, gaggers and other foreign matter are caught on the screen in the hopper.

The sand after being cleaned collects in the hopper directly beneath the floor above the pressure tank. Every time the air pressure in the tank is removed the filling valve in the tank head opens automatically and the accumulated sand flows by gravity into the pressure tank. The control mechanism is entirely air operated giving any variation from a lean to a dense mixture of sand and air. Air valves are located inside the house at a convenient height from the floor. It is unnecessary to enter the pit to reach any control. However, space is allowed for a man to enter and remove wire and sprue that gather on the screen.

Statistics on the absorption of chemical equipment and materials by in-



A SYSTEM OF ANGLES AND BAFFLES RIGIDLY TIED TOGETHER FORMS THE VENTILATING CEILING OF THIS SAND BLAST ROOM

dustries and geographical sections, and other statistical information pertaining to chemical equipment now are being collected by the Chemical Equipment association. "Chemical equipment is in effect a barometric register of general industrial conditions both at home and abroad. In many ways, the absorption of chemical equipment and materials is as reliable and as specialized an index to general industrial conditions as the production of pig iron was considered before the war, or as the Federal Reserve bank's discount rates are regarded now," according to Pierce D. Schenck, president of the association.

Builds Large Mill Motor for Ford Plant

What is claimed to be the largest alternating current motor for steel mill use ever used in this country is being designed by the General Electric Co., Schenectady, N. Y., for the River Rouge plant of the Ford Motor Co. This motor will develop 8000-horsepower with a speed of 240 revolutions per minute and will be used to drive a large blooming mill. For the present high grade alloy steel will be the principal product of the new mill now under construction.

The plant will be equipped with a merchant mill for which the General Electric Co. is building a 4500-horsepower, direct-current motor, the power for which will be supplied by four 2000-kilowatt motor generator sets. Included in the order for the equipment in the new mill are 15 1500-kilowatt motor-generator sets, three 10,000-kilowatt-ampere autotransformers, and 44 mill motors ranging in size from 4 to 100 horsepower.

Receives Orders for New Mill Equipment

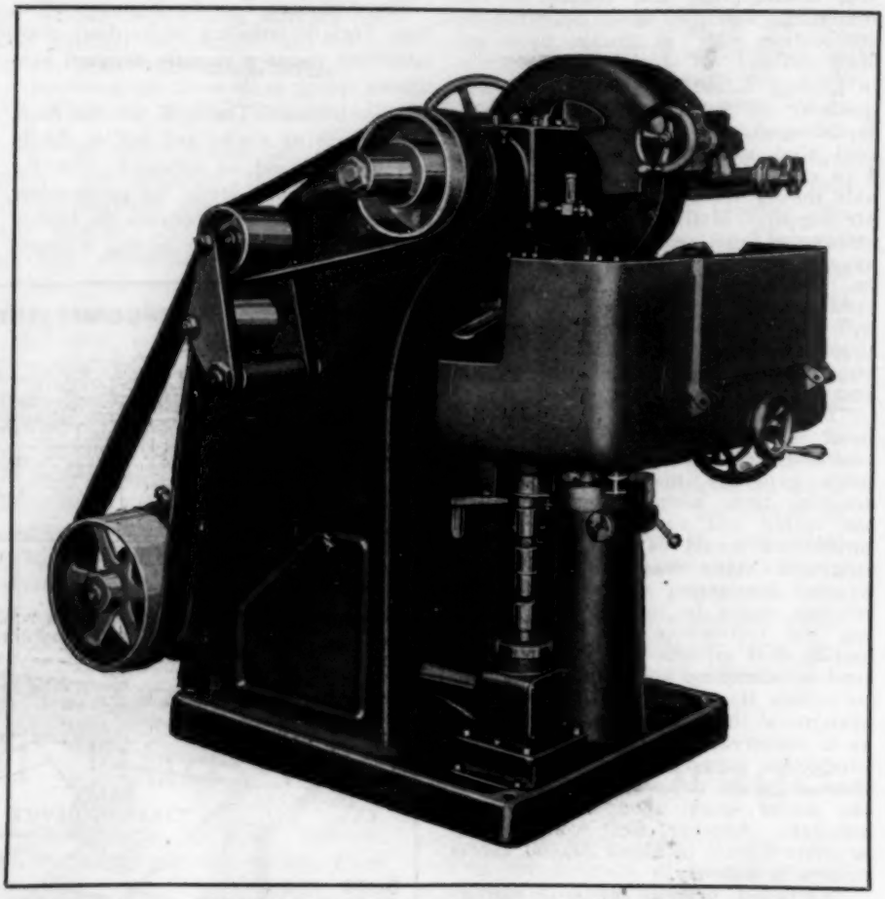
An order for electrical steel mill equipment amounting to about $70,000 and including mill motors, control apparatus and a switchboard has just been received by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., from the American Rolling Mill Co., Middletown, O. The Inland Steel Co., Chicago, also has purchased electrical mill equipment amounting to about $375,000, the apparatus to be used in expansion of the company's mills. The electrical equipment in this order consists of one 1500-horsepower, wound-rotor motor for the finishing stand of a sheet bar mill, one 6250-horsepower, wound-rotor motor for a 24-inch continuous billet mill, five 1000-kilowatt, synchronous converters with transformers, and one 12,500-kilovolt-ampere, turbogenerator unit with a 15,000 square foot condenser.

Makes Improvements on Centerless Grinder

An improved centerless grinding machine, designed for the production grinding of straight cylindrical parts such as piston pins, shafts, rubber and fiber rods, drill rods, valve parts bearing rolls, races, etc. has been developed by the Detroit Machine Tool Co., Detroit.

It embodies the basic principles of former models, the lower or feed wheel being directly underneath the grinding wheel so that the work in process of grinding rests upon and is rotated by the feed member. The feed wheel is twice the width of the upper or grinding wheel so that the work is rotating at the correct speed as it comes in grinding contact. The lower wheel is mounted on a vertical column on which it can be pivoted to vary its angle with the grinding wheel up to 10 degrees. This feature controls the traverse feed of the work through the machine.

The work diameter is controlled by a sensitive adjustment in the lower unit column. Accurate adjustments are made by a large hand wheel equipped with a graduated dial. The change gear box is fitted with sliding gears to provide two grinding and two feed-wheel speeds. The main drive pulley operates at 750 revolutions per minute imparting grinding wheel speeds of 1080 and 1176 revolutions per minute. The feed wheel speeds are 33 and 44 revolutions per minute to accommodate various parts.



CENTERLESS GRINDER DESIGNED FOR PRODUCTION WORK

Promoting Education

(*Continued from Page* 1750)

training, 378 per cent in specialist training, and 240 per cent in foreman training.

I see no reason why the basic principle of training as applied to industry should differ, whether you are operating a machine shop, a silk mill, a paper mill, a railroad or even a bank. It can be accepted as a general proposition that the factory with intelligently trained workers has lower production costs, which make possible lower selling costs with consequent increase of output and sales. In times of keen competition these elements are frequently the deciding factors between profit and loss.

Intelligent training also makes possible sustained production on a schedule which permits a higher wage for the worker, adequate returns on the capital invested, and continued cordial relations between the employes and the management.

Steel Ingot

Production Higher in May but Daily Rate Shows Loss

Another production record was broken in May when steel ingots, with a gain of approximately 216,100 tons, over April established another high point output. May, however, had two less working days than April and the average daily rate showed a slight loss from the record in April, which was the highest in history. According to statistics compiled by the American Iron and Steel institute, from reports received from 30 companies which in 1922 made 84.13 per cent of the total for the country, the production in May was 3,537,753 gross tons. This output was 216,475 tons better than the 3,321,278 tons of April and 135,746 tons better than the 3,402,007 tons of March, which until May was the highest total on record. May had 27 working days as compared with 25 in April.

Following are the institute's production figures for 1922 and the first five months of 1923:

1922	Open hearth	Bessemer	All other	Total
Jan.	1,260,809	331,851	822	1,593,482
Feb.	1,395,835	348,571	616	1,745,022
March ..	1,918,570	451,386	795	2,370,751
April	1,997,465	445,939	1,109	2,444,513
May	2,214,774	494,893	1,474	2,711,141
June	2,143,708	487,851	2,918	2,634,477
July	2,020,572	464,047	2,485	2,487,104
Aug.	1,807,310	404,379	2,893	2,214,582
Sept.	1,911,147	460,127	2,505	2,373,779
Oct.	2,352,207	518,010	2,198	2,872,415
Nov.	2,360,903	525,945	2,449	2,889,297
Dec.	2,241,104	536,214	2,572	2,779,890
Total for year ...	23,624,404	5,469,213	22,836	29,116,453
Jan. 1923.	2,571,491	677,486	2,717	3,251,694
Feb. ...	2,290,418	625,838	2,761	2,919,017
March ..	2,656,134	742,564	3,309	3,402,007
April	2,594,706	722,719	3,853	3,321,278
May	2,744,201	788,350	5,202	3,537,753

With 27 working days in May the average daily production of the 30 companies was 131,028 tons per day. This rate was 1823 tons per day less than the 132,851-ton daily rate of April which is the highest on record. Based upon the average daily rate of the 30 companies and the factor of 84.13 as supplied by the institute, the average daily production for the whole country in May was 155,744 tons. Against the 157,911-ton daily rate of the country in April, this was a loss of 2167 tons per day.

On the basis of the average daily output of May and 311 working days in the year, the annual rate of production for the 30 companies during the month was approximately 40,750,000 tons and about 565,000 tons less than the 41,315,000-ton rate of the month before. Calculated in a similar way, the approximate annual rate of the whole country in May was 48,440,000 tons, or about 670,000 tons less than the 49,110,000-ton rate of April.

Bessemer Profits Large

Washington, June 8.—American Consul Grace at Sheffield, Eng., in reporting the dismantling of the original Bessemer plant established in 1856 at Sheffield, relates some of the huge profits rolled up by the five partners in Henry Bessemer & Co. Fourteen years after the works were established they were sold for 24 times their original capitalization. Meanwhile, enormous royalties were being paid, and in 14 years the partners took out $81 for every $1 they put in. Only Siemens-Martin furnaces are now in operation.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

THE Connecticut Foundrymen's association held its annual meeting and dinner at the Hartford club, Hartford, Conn., June 8, when officers were elected as follows: President, Fred W. Stickle, Capital Foundry Co., Hartford; vice president, C. E. Bilton Machine Tool Co., Bridgeport; secretary, C. S. Neuman, Union Mfg. Co., New Britain; treasurer, J. M. Woolson, S. H. Barnum estate, New Haven; board of managers, the officers and A. F. Corbin, Union Mfg. Co., New Britain, F. B. Farnsworth, McLagon Foundry Co., New Haven, G. A. Ray, Taylor & Fenn Co., Hartford, S. Reynolds, Putnam Foundry & Machine Co., Putnam, and B. W. Spencer. The latter succeeds W. C. Comstock.

* * *

Chemical Engineers Meet

The American Institute of Chemical Engineers will hold its fifteenth semiannual meeting June 20 to 23 at the hotel du Pont, Wilmington, Del. Included in the papers will be one on "Acid and Abrasion-Resisting Metals and Materials" by W. E. Piper and another on "Modern Methods of Metal Protection and Finishing," by L. E. Eckelmann. There will be numerous excursions to industrial plants in Wilmington and vicinity and the delegates to the convention will be entertained at the homes of Pierre S. du Pont and Irenee du Pont.

* * *

To Submit Classification

The National Association of Waste Material Dealers, Inc., will hold its regular quarterly meeting at the Hotel Astor, New York, June 20. The various division meetings on scrap metals, scrap rubber, woolen rags, waste paper, paper stock an foreign trade, will be held on June 19 and 20, preceding the quarterly meeting. At the meeting of the metal division, a new metal classification for the ensuing year will be submitted for approval.

* * *

Organize Engineering Society

A state branch of the American Society of Mechanical Engineers is to be organized in New Hampshire to include local sections in Concord and other cities. Charles Penrose, Philadelphia and Ernest Hartford, New York, are representing the national organization in the matter.

* * *

Explains Gas Production

Before the regular monthly meeting of the Engineers' Society of Western Pennsylvania, held Tuesday June 12 in the William Penn hotel, Pittsburgh, E. J. Stephany, superintendent of the sales department, Equitable Gas Co., Pittsburgh, fully described "Modern Natural Gas Engineering." The paper was illustrated by lantern slides, giving some early natural gas history and dealing with the many problems of sustained production during peak demand periods.

Convention Calendar

June 14-15—American Society for Steel Treating. Spring sectional meeting, Hotel Bethlehem, Bethlehem, Pa. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

June 20-23—American Institute of Chemical Engineers. Summer meeting at Wilmington, Del. J. C. Olson, Polytechnic institute, Brooklyn, N. Y., is secretary.

June 25-29—American Society for Testing Materials, annual meeting at the Chalfonte-Haddon hall hotel, Atlantic City, N. J. C. L. Warwick, 1315 Spruce street, Philadelphia, is secretary.

June 25-29—American Institute of Electrical Engineers. Annual convention at Swampscott, Mass. F. L. Hutchinson, 33 West Thirty-ninth street, New York, is secretary.

Sept. 24-28—American Association of Iron and Steel Electrical Engineers. Convention and exhibition, Auditorium, Buffalo. Headquarters of the association are located at 1007 Empire building, Pittsburgh.

Taylor Society Discusses Cycle

Economists and Industrial Managers Advocate Measures for Avoiding Extremes in Business Fluctuations—Groups Study Planning Systems, as Feature of Plant Visitations

BUSINESS signs of the times and how extremes in the economic cycle may be avoided were the principal subjects of discussion at the meeting of the Taylor society in Syracuse, N. Y., June 7-9. Men of practical business affairs who are students of political economy, and also experts on scientific planning as visualized by Frederick Winslow Taylor, contributed to a comprehensive program of the meeting that was held by the society in cooperation with its Central New York section and the New York Southern Tier section.

Group studies of related problems in factory management were features of several plant inspections, where work was seen and methods described in detail. A great variety of industrial lines were represented, including a number of iron and steel consuming interests. A number of colleges having departments of business administration were represented. A Swiss, a Japanese and a Russian, students of American industrial enterprises, were among the 200 who attended. The importance of bringing more trained engineers to specialize in scientific management was emphasized by those having charge of industrial operations.

The most animated discussion followed the striking of the vital spot of what is the best policy for industrial managers to pursue under business circumstances as they exist today. Conservatism and retrenchment, or a forward march, snapping into it with courage and conviction that there still is a long period of "good business ahead." A research worker in economics advocated caution, and action now as though a period of depression was about to set in, while the head of a large manufacturing institution, who also is a distinguished economist, favored a reversal of the old policy of retrenchment, and a redoubling of energy and sales effort. The meeting was productive of a great many timely views on the business trend.

Express Opinions on What Should Be Done Now

A COMPLETE reversal of the customary policy of higher business executives in regard to "cycles" is necessary, N. I. Stone, general manager of the Hickey-Freeman Co., Rochester, N. Y., told members of the Taylor society at their first session Thursday. What from a "short-range point of view" seems the acme of conservatism and sound business policy, he said in discussing advice to be conservative, becomes "short sighted and suicidal" from the long-range view of the business cycle, Mr. Stone continued:

"When business falls off or only tends to fall off, the usual advice of the banker or the policy of the conservative chairman of the board of directors is to reduce the overhead. Executives of long experience, even though of minor standing, are unceremoniously dismissed, the selling force is greatly curtailed, the advertising appropriation is cut down and everything in the nature of an overhead expense is cut to the bone. This is pointed to 'with pride' in the report to the stockholders as evidence of sound management.

"Not so long ago, Henry S. Dennison, president of the Dennison Mfg. Co., surprised audiences of economists and business men by telling them of the success attained by his company by following a policy which the old-fashioned banker and business man would call reckless. When business was booming in 1919 and in the early part of 1920, Dennison company allowed its selling force to become greatly depleted by failing to fill vacancies created by resignations and discharges. When Mr. Dennison saw the signs of the approaching storm of 1920, he began preparations for meeting the coming emergency not by cutting down the force still further, but by practically doubling it, to be in a position to make the increased selling effort which bad times require. Instead of curtailing his advertising appropriation, he spent more money than ever when the depression set in. Instead of 'trimming his sails,' he put new products on the market when old ones did not sell as much as before. Instead of being liberal with credit in boom times and curtailing it to the limit in hard times, he reversed the process and thereby flattened the cycle curve of his own business to an extent that seems almost unbelievable."

Credits' Influence on Cycles

Mr. Stone called attention "to the one outstanding feature which distinguishes the present industrial order from all its predecessors and which is more responsible for the modern phenomenon of recurring business cycles than any other single economic factor." This, he said, is the fact that "modern industry is built on credit and is constantly at work creating supplies in anticipation of a future demand, while under the precapitalistic system the producers always worked for the customer, whom he knew personally; supply followed demand and transactions were based on cash payment in exchange of goods, but not on credit."

In his opinion engineering efficiency will sharpen the weapon of the individual concern for the competitive struggle, but "if every manufacturing concern were on an equal plane of efficiency it would not prevent the recurrence of the business cycle." On the theory that the big force in modern business is credit, Mr. Stone held that the control of credit, with the business cycle in mind, has great possibilities, the opportunities under the federal reserve system for unified control of credit from the long-range view of the business cycle being "well-nigh limitless."

"It is obvious," he said, "that the board is the one agency in the country which today is in possession of more complete information as to business activities of the country than any other institution. With that information in hand it is in a position to tell when the industrial activities of the country have reached a point of saturation beyond which further expansion means only competition for existing supplies of material and labor which can only lead to artificial price inflation, with the inevitable collapse in the end. A word of warning from the board coupled with refusal to discount commercial paper given for financing additional business can put more powerful brakes upon the overspeeding engine of industry than any other single force."

Conversely, the board is in a position to encourage the resumption of activities at a much earlier stage than has been possible for individual banks. Next to the control of credits, Mr. Stone said, is the control of public work. If legislative bodies can be induced to adopt a decennial, or a

quinquennial budget, instead of making annual appropriations, and if executive authorities are entrusted with power to make expenditures according to inflation or depression of business, that would tend to flatten the curve of the business cycle. He recommended the manufacturing for stock, when possible, during times of depression.

Advocates Conservatism

Mr. Stone was discussing a paper read by Willford I. King, bureau of economic research, New York, "Safeguarding Industry by Stabilizing Employment," wherein Mr. King advocated a policy of conservatism at this time. The bureau made a study of business cycles and unemployment for a special committee appointed by Secretary Hoover, acting on a suggestion of the President's conference on unemployment in September, 1921. Mr. King said:

"It seems to me that now during the boom is the time to be conservative. Raise wages as little as possible thus avoiding the necessity of severe wage cuts at a later date; adopt a hand-to-mouth policy in buying raw materials; scrutinize carefully all orders from your customers; go slow in accepting orders from men whose credit is not of the best; see that all contracts are definite so that the chance for cancellation is reduced to a minimum; postpone building those additions to your plant which seem so necessary; make the old machinery do a little while longer; reduce your stocks of finished products to a minimum; and, above all—accumulate cash. Sell all but the most gilt-edged securities; dispose of any unnecessary assets; and strengthen your cash position at all costs!

"The chances are that by late 1924 or early 1925 business will again be very dull, orders few, and prices discouragingly low. Now is the time to plan for the depression ahead. Study the statistics of your own business to see what the long time trends are, and plan now the buildings which you will need, the new machinery which you will require to take care of the normal growth of your enterprises.

"Arrange to construct these during the depression when labor and material costs are low. Remember that after the depression will come another boom, and that, during this next boom, you will again have difficulty in making goods fast enough to fill orders as they come in. Plan now to make goods for stock during the lean months while materials are cheap. Arrange also a campaign for securing orders well in advance. If you go into a depression with small stocks on hand, you will not find that the accumulation of stock manufactured during the dull times will so greatly overload your warehouses.

"With an abundance of ready cash on hand—the cash which you have saved during the boom—you will be able to take advantage of bargain prices in materials. A few manufacturers have demonstrated that by such careful long-time planning and by conservative action during the boom, they are able to guarantee steady work to all their employes who care to remain on the job.

"If during the dull times you have manufactured quantities of goods for stock, it will not be necessary to hire many additional workers for the next boom, and hence you will have little occasion to pay fancy wages in order to fill your orders.

"I may be unduly optimistic, but I believe that if you will study the business cycle thoroughly until you know the position that you occupy in it at every time, and if you understand the relation of the activities of your own particular business to the cyclical fluctuations of industry in general, you will be able to approach, if not attain stability in operations from year to year."

Mr. King said that it was his personal judgment the idea of profit sharing is entirely contrary to the interests of the employe, as the employer is the one who should bear the brunt of the depression and therefore should be entitled to the gains acquired during a boom. "I see no prospect of gain and every prospect of loss if the workers obtain a controlling voice in the direction of industry," he said, "but the workers have a right to demand steady employment. Sound economic policy does not demand that we give men unemployment insurance while they stand idle and produce nothing."

Carleton F. Brown, general manager, Corona Typewriter Co., Groton, N. Y., in discussing Mr. King's paper, said that individual business enterprises should have complete data and charts concerning their own affairs, to work in with charts of a general character. He advocated careful study of the problem of the seasonal cycle, saying that by leveling the curves of the cycle, industries jointly will reduce those of the larger business trend. Seasonal swings may be narrowed by more systematic planning in all departments. He gave the following essentials for successful planning:

Know the theory of the cycle.

Study general business conditions and the details of your own particular business in comparison therewith.

Know at all times your position in the cycle.

Form definite sales, production and financial policies.

Above all, have the will to resist in periods of prosperity the siren lure of large sales and big profits obtained at the expense of the future of your business, and have the courage to plan and execute for the future when in the depth of depression.

Group Studies at Plant

The members of the society had the opportunity to obtain details on scientific planning as worked out at the Groton manufacturing plant and the Cortland, N. Y., assembly plant of the Corona company when they inspected the plants Friday. Following the inspection the party was divided in groups, members attending those sessions devoted to the study of various features of the system which interested them particularly. Company representatives explained production and merchandising methods.

The company manufactures parts of its machine for stock, the parts being assembled as machines are required. In the assembly work the use of special fixtures at practically all stages, leaving the operatives' hands comparatively free, makes for a high productive rate. A point of much interest was the so-called "string board," with many rows of adjustable vertical strings, white, red and green. The positions of knots on the strings show the amounts of materials on hand, expressed in finished machines, and the number of orders for the machines. The gap between material and machines is shown by a scale on the board.

Discuss Subject of Planning

The subject of planning received further attention Friday night when Keppele Hall, Joseph & Feiss Co., Cleveland, discussed the Taylor theory and outlined methods that have been found useful. He said the planning department can be made a "most dependable and effective instrument of executive control of a business enterprise. Scientifically developed planning functions are the compass and charts by which the executive must guide his craft in times of business stress. To attempt to do without them is to invite disaster." He emphasized the necessity of complete statistical data on all factors which may effect business.

"If future developments in industry are to evidence themselves largely along lines of better management," he said, "there will be an increasing demand for men with engineering experience to fill executive positions. This is inevitable, for real management is a science which is steadily developing its own theories and laws and requiring more and more the engineering mind and the engineering approach. It is much easier for the engineer to acquire the additional business experience that is necessary to conduct intelligently industrial affairs than it is for the average business man to master the additional engineering requirements that he now lacks."

Howard G. Benedict, general manager, A. J. Deer Co. Inc., Hornell, N. Y., in discussing Mr. Hall's paper said that well-organized statistical departments are coming to be recognized as the first essential of scientific planning. He emphasized the need for budgeting, and said this should include the sales department.

Sales engineering received more attention Thursday night when a paper "The Sales Machine; 1923 Model" was read by H. R. Wellman, professor of marketing, Amos Tuck school, Dartmouth college, and vice president in charge of selling, Walter M. Lowney Co., Boston. Mr. Wellman traced the

beginning of scientific sales planning, and the scheduling of production and sales. In speaking of the extent to which financial interests sometimes drive for sales illogically, he cited an instance where a sales department in putting over the last $1,000,000 worth of sales lost money. He said:

"There are three major divisions of business, finance, production and distribution. Successful business depends upon these three departments working in harmony. They are indeed the great trinity of business. They cannot operate profitably if operated independently. Unconsciously perhaps, we have thrown the machine out of alignment. We have made wonderful progress in methods of production. We are making progress in sales planning. All of these improvements are worth while in themselves, but are actually harmful to business generally unless the same advance or adjustment is made in finance.

"While sales planning is reaching the production level, finance should be brought to understand the absolute necessity of working intelligently with the other departments. In brief, it should learn merchandising. In the old days finance could estimate possibilities in terms of plant production. Today it must estimate *probabilities* in terms of sales as well as production."

"Sane advertising," continued Mr. Wellman, "is in my opinion the greatest sales weapon we have today, used intelligently. It will reduce selling costs." Mr. Wellman's paper was discussed briefly by C. W. Fulton, works manager, Goulds Mfg. Co., Seneca Falls, N. Y., and by Prof. Richard Lansburg, University of Pennsylvania. H. H. Person, managing director, Taylor society, commented on the papers as they were presented. E. W. Kendall, general sales manager, Pass & Seymour Inc., Syracuse, presided at the meeting Thursday evening and S. H. Cook, vice president, Brown-Lipe-Chapin Co., Syracuse, presided Friday evening. The meeting closed Saturday with an inspection of the plant of H. H. Franklin Co., Syracuse, where the members had the opportunity to study further details of the Taylor system in Franklin management.

Italian Output Grows

Washington, June 12.—French occupation of the Ruhr has prompted an increase in Italian production of pig iron, according to a report by Commercial Attache MacLean at Rome to the department of commerce. Four of the 11 Italian blast furnaces are now active, producing at the rate of 210,000 tons of pig iron annually. This compares with a production of 91,000 tons in 1922 and the war maximum of 471,000 tons in 1917. Imported pig iron was quoted at 820 to 890 lire ($47.70) per ton when Mr. MacLean made his report, May 5.

Report on 12-Hour Shift Is Criticized

New York, June 12.—A statement criticizing the report of the committee of the American Iron and Steel institute on the 12-hour shift in the steel industry has been issued in the name of the commission on the church and social service of the Federal Council of Churches, the social action department of the National Catholic Welfare council, and the social justice commission of the Central Conference of American Rabbis. In round figures these groups are said to represent 50,000,000 members. The statement in part follows:

"The report of the committee shatters the public confidence that was inspired by the creation of the committee a year ago at the request of the President of the United States. It is a definite rejection of the proposal for the abolition of the long day. The public demand in response to which the committee was appointed is set aside as a 'sentiment' which was 'not created or endorsed by the workmen themselves.' The testimony of competent investigators, including eminent societies, is ignored, and the conclusion is put forth without supporting data that the 12-hour day 'has not of itself been an injury to the employes physically, mentally or morally.'

"Objection to the long day because of its effect on the family life of the 12-hour workers is disposed of in the report with the complacent comment that it is questionable whether men who work shorter hours actually spend their leisure time at home. This is an unworthy and untenable argument which will be bitterly resented by the millions of home-loving workingmen in America.

"The plea that a shortage of labor makes impracticable the change from two to three shifts of workmen, affords but a meager defense. The shortage of labor was not the reason for the failure to abolish the long day two years ago when the public waited expectantly for such a salutary step on the part of the United States Steel Corp.

"The one redeeming feature of the committee's report is the intimation that it is not final. The public has waited long for the fulfillment of a virtual promise from the industry that the 12-hour day would be abandoned. The public expects the initiative to be taken by the United States Steel Corp. It is a task that presents admitted difficulties, but none that a powerful corporation which has accumulated an enormous surplus should find insurmountable. The forces of organized religion in America are now warranted in declaring that this morally indefensible regime of the 12-hour day must come to an end. A further report is due from the Iron and Steel institute—a report of a very different tenor."

Cadmium Output Increases

Washington, June 12.—Metallic cadmium production in 1922 was nearly double that of the proceding year, according to the geological survey, department of the interior. Production of cadmium in the United States began in a small way in 1906 and grew steadily until 1917 when the maximum output was reached. The output has fallen off materially since 1917, when 207,408 pounds were produced. Production in 1922 amounted to 131,590 pounds as compared with 68,501 pounds in 1921.

Coke Production Shows Sharp Decline

Washington, June 12.—Production of beehive coke declined sharply in the week ended June 2 when compared with the preceding week according to the geological survey. On the basis of the number of cars loaded on the principal coke carriers the total output is estimated at 379,000 tons. Decreases are reported chiefly from Pennsylvania, Ohio, West Virginia and Virginia. The following table shows the comparative production of beehive coke by weeks:

	Week ended—		
	June 2 1923(a)	May 26 1923(b)	June 3 1922
Pennsylvania and Ohio.	306,000	334,000	69,000
West Virginia	20,000	23,000	6,000
Alabama, Kentucky, Tennessee and Georgia	24,000	23,000	9,000
Virginia	14,000	20,000	5,000
Colorado and New Mexico	9,000	9,000	5,000
Washington and Utah..	6,000	6,000	3,000
United States total.....	379,000	415,000	97,000
Daily average	63,000	69,000	16,000

(a) Subject to revision. (b) Revised from last report.

Returns on car loadings during the week indicate a slight decrease in the rate of production to a level below that reached the fourth week in May. The total output for the week will be in the neighborhood of 10,700,000 net tons.

Dedicates Memorial

Elbert H. Gary, chairman of the United States Steel Corp., on June 6, dedicated a 20-foot granite shaft in the Holy Name Cemetery, Jersey City, N. J., to the memory of the late Thomas Murray. Mr. Murray, who died Dec. 27, 1921, was assistant secretary-treasurer of the Steel Corp. and a friend of Judge Gary. Judge Gary said, "Mr. Murray exemplified the principles of truth, honesty and Christianity. For this reason, we, his friends and associates, dedicate this granite shaft to his memory. I would give anything in my possession for such a character, reputation and friendships." The shaft bears the inscription: "To the memory of Thomas Murray, born December 14, 1867, died December 27, 1922. Efficient, faithful, honest. This shaft was erected by his friend, Elbert H. Gary."

Delay Buying

In Refractory Market—Prices Holding Firm for Present

Pittsburgh, June 12.—While a tendency to withhold forward buying of refractories is manifested by most of the larger and all of the smaller users, occasionally an inquiry develops involving one-half million brick or more. One of the latest of these is the 600,000-brick requirement of the West Penn Power Co., Springdale, Pa., for boiler settings. The iron and steel industry continues to take in brick on order but many consumers are using up their shed stocks and deferring action on their replacement. A few purchases recently noted have involved around 200,000 brick each and one or two larger inquiries now

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	48.00 to 51.00
Pennsylvania, No. 2	43.00 to 46.00
Ohio, No. 1	45.00 to 47.00
Ohio, No. 2	40.00 to 43.00
Illinois, No. 1	48.00 to 50.00
Illinois, No. 2	45.00 to 47.00
Kentucky, No. 1	45.00 to 47.00
Kentucky, No. 2	40.00 to 42.00
Missouri, No. 1	43.00 to 45.00
Missouri, high grade	45.00 to 53.00
Maryland, No. 1	50.00 to 53.00
Maryland, No. 2	44.00 to 47.00

SILICA BRICK

Pennsylvania	$46.00 to 47.00
Chicago	52.00 to 54.00
Birmingham	48.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

are current. Specifications on contracts from large users are received regularly and one or two releases on orders held up have lately been received such as one from the Wheeling Steel Corp., for Steubenville, O. Kiln operations are proceeding at a 70 to 80 per cent of capacity rate and brick makers generally are optimistic concerning the future. New construction projects are not numerous although the new blast furnace and open hearths for a Canton, O., interest are expected to require several million brick. Purchases on this lot, however, will not be made for a few weeks.

In connection with prices, representative sellers look on the market as firm, notwithstanding a few minor concessions offered under the minimum quoted herewith. Some smaller makers with no backlogs of business, who always cut the market levels, are active in offering slightly lower figures. Because production costs still are high, however, makers generally see no hope for a price reduciton in the immediate future.

The Bethlehem Steel Co., is understood to have closed recently on 200,000 chrome brick and a few other sales of 25,000 or 50,000 brick each are noted. Magnesite brick sales in carload lots are in fair number. The prices are unchanged at $50 and $65, respectively.

Hurley Sales Increase

The Hurley Machine Co., Chicago, in which General Electric Co., has a stock investment, reports for 1922 net income of $635,942 after Federal taxes. An increase of 27 per cent over the previous year was reported in the net sales of electric washing and ironing machines. For the first four months of the current year orders exceeded $3,000,000, while billings were $2,316,002, a gain of $831,030 over last year. In his annual remarks to stockholders. Edward N. Hurley, Chairman, points out that prospects for the current year are promising. He says that no increases in the price of the company's products were made last year, none have thus far been made, nor is there any prospect that the prices will be increased in 1923.

Hold Sales Convention

Reports from the annual sales convention of the International Fuel & Iron Corp., Pittsburgh, June 1 and 2, show the biggest business year to date in the history of the company. The convention was attended by 22 representatives of district and local sales offices throughout the country. The company announced May tonnage was the largest in the history of the company, and that June bookings indicate another record month. The opinion was expressed that business in general and the coal business in particular would be on a sound basis for the balance of 1923.

Shop Men Return to Work

New York, June 12.—More than 1200 shop men of the Central Railroad of New Jersey who went on strike 11 months ago have voted to return to work. The strike, which started over the refusal of the shop men to accept the wage cut of the railroad labor board, in its later stages resolved itself into a question of whether or not the railroad would restore seniority rights. This is the first instance where the shop employes of an eastern railroad had voted to return to work, although settlements had been made on a number of other railroads under the Baltimore plan.

The New York Art Metal Works, 531 East Seventeenth street, New York, has filed a schedule in bankruptcy showing liabilities of $6838 and assets of $3825.

Demand Falls

In Sulphate of Ammonia Market—Stocks Meeting Requirements

New York, June 12.—Following the recent heavy seasonal buying, demand for sulphate of ammonia has slumped off with the market this week again slightly easier. Spot business for domestic account is now being booked at $3.10 to $3.15 works, and for foreign account at $3.45 to $3.50, port in double bags. The heavy seasonal contracting of the past four or five weeks has virtually ended.

Light oil distillates are in sufficient volume to meet all present spot requirements.

Until recently, supplies of toluol and solvent naphtha have been regarded as fairly scarce. Prices are unchanged, pure

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene flake	0.10
Naphthalene balls	0.11

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.10 to $3.15

Contract

Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene flake	0.10
Naphthalene balls	0.11

benzol holding at 27 cents works in tanks, and 32 cents in drums; 90 per cent benzol, 25 cents in tanks, and 30 cents in drums; toluol, 30 cents in tanks, and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; and commercial xylol, 29 cents in tanks, and 34 cents in drums.

Demand for ball and flake naphthalene is somewhat easier, with prices unchanged at 10 cents works for flakes and 11 cents for balls, in carload lots. A premium of one cent is asked for material in less than carload lots.

An assignment of the Thornburgh Mfg. Co., Bowling Green, O., recently was made by B. C. Kramer, Harold C. Babcock and Bion S. Schutt. The personal property of the company was listed at $20,000 and the real estate at $20,000. W. W. Browning, C. A. Bartlett and A. E. Avery have been appointed appraisers of the property. Poor business in farm implements during the past three years is understood to have caused the assignment.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

ROBERT D. McCARTER, president, Surplus Steel Exchange, Inc., whose organization was referred to in last week's issue of IRON TRADE REVIEW is a member of the consulting engineering firm of McCarter & Cooper, New York. Mr. McCarter formerly was identified with the General Electric Co. and the Westinghouse companies, having been consulting engineer of the European Westinghouse companies and president of the Russian Westinghouse Electric Co.

George E. Dix, vice president of the Surplus Steel Exchange, Inc., began his connection with the steel industry in 1907 with the Carnegie Steel Co. at its Waverly warehouses. In 1916 he became assistant to the general manager of sales of the Midvale Steel & Ordnance Co. and during the last four years and until the dissolution of the Consolidated Steel Corp. was assistant to the vice president of the latter company.

William L. Cooper, treasurer of the Surplus Steel Exchange, Inc., formerly was associated with the R. W. Hunt Co. for 15 years, having been European manager during part of that time. Mr. Cooper is a partner in McCarter & Cooper. Edward Michaud, secretary and general manager of the Surplus Exchange, formerly was identified with the Carnegie and Midvale companies and the Consolidated Steel Corp.

Stanley H. Bullard, vice president of the Bullard Machine Tool Co., Bridgeport, Conn., has been re-elected president of the Connecticut chamber of commerce.

F. M. Gibson has been placed in charge of the offices recently opened in the Yusen building, Marunouchi, Tokio, by the Bethlehem Steel Export Corp.

Elmer J. Bryant, for 10 years manager of the Taft-Peirce Mfg. Co., Woonsocket, R. I., has resigned to become manager of the gage department of the Greenfield Tap & Die Corp., Greenfield, Mass.

W. M. Townsend, formerly factory manager of the Automobile Screw Products Co., Cleveland and prior to that time connected with the Atlas Bolt & Screw Co., Cleveland, has become affiliated with the Cleveland Duplex Machinery Co., Inc. 1224 W. Sixth street, Cleveland as sales manager specializing in semiautomatic and automatic machinery.

Benjamin Sklovsky has been appointed Chicago district representative for the North American Mfg. Co., Cleveland, with offices at 53 West Jackson boulevard, Chicago.

Radford Stockbridge, president of the Stockbridge Machine Co., Worcester, Mass., was presented with a purse of gold by the employes in honor of his 72nd birthday anniversary, May 24.

J. F. Newman, for the past 11 years purchasing agent for the Wierton Steel Co., Weirton, W. Va., has resigned that position to engage in business for himself at Pittsburgh.

Frederick B. Stevens, maker of foundry supplies, has been appointed a member of the Detroit civil service commission by Mayor Frank E. Doremus.

Elmer E. Neal has been appointed works manager of the Plainville, Conn., plant of the Standard Steel & Bearings, Inc. He directed the making of guns during the war for the Marlin-Rockwell Corp.

Frank Maculay, for 11 years master mechanic of the Petroleum Iron Works Co., Masury, Pa., has been appointed superintendent of the Beaumont, Tex., plant of the company and has left to assume his new duties.

Philip B. Gale, president of the Hartford Machine Screw Co., a subsidiary of the Standard Screw Co., Hartford, Conn., will sail June 19 for a two months tour of France, Belgium and Holland.

C. C. Younggreen has resigned as director of advertising and publicity of the J. I. Case Plow Works Co., Racine, Wis., and on June 1 becomes vice president of the Klau, Van Pietersom-Dunlap Agency, Milwaukee.

D. B. Stokes, formerly western sales manager of the United States Cast Iron Pipe & Foundry Co., Burlington, N. J., has been made general manager of the same company with offices in the Morris building, Philadelphia. W. G. Savage, formerly eastern sales manager is to be western sales manager with offices in the Peoples Gas building, Chicago. C. E. Braun has been appointed western sales manager with headquarters in Chicago.

Henry Donovan has been appointed general manager of all manufacturing departments of the General American Tank Car Corp. and the General American Car Co., Chicago. He formerly was connected with the Union Pacific Railroad system.

L. D. Granger of the manager's staff of the Wickwire Spencer Steel Corp., Worcester, Mass., has been made temporary superintendent of the Morgan works in that city, succeeding Henry K. Swinscoe, transferred to the Clinton, Mass., works as assistant superintendent.

Dr. Homer Gage, president of the Crompton & Knowles Loom Works, Worcester, Mass., has been elected vice president of the American Surgical association. Dr. Gage, who is an eminent surgeon, is considering retiring from his profession to devote all his time as head of the loom works.

S. P. Broome, former Pittsburgh manager of Naylor & Co., New York, has joined the staff of the Stalnaker Steel Co., Pittsburgh, and will continue to handle the business of the Naylor company, the Stalnaker company having been appointed its representative in Pittsburgh territory.

William J. Wooldridge, former manager of the electrical sheet department of the Whitaker-Glessner Co., Portsmouth, O., and more recently holding the same position with the Wheeling Steel Corp., Wheeling, W. Va., recently resigned his position. His future plans have not been announced.

Frank L. Estep of the firm of Perin & Marshall, iron and steel works engineers, New York, is completing his work connected with building the new plant of the Tinplate Co. of India and expects to leave Jamshedpur late in June for the United States via London. Mr. Estep states the iron and steel industry of India is growing rapidly, largely as a result of the combination of American and British enterprise in its development.

Obituaries

CLYDE M. CARR, former president of Joseph T. Ryerson & Son, Inc., Chicago, which position he resigned last January, died June 5 at his home in Chicago. He had been ill for several weeks. He was born in Will county, Ill., July 7, 1869 and after being educated at Lake Forest academy, Northwestern and Princeton universities, he was employed by the Peoples Gas Light & Coke Co., Chicago. He later became a salesman for W. S. Mallory & Co., iron jobbers. In 1891 he became connected with the Ryerson organization. He was a director of the Chicago Great Western railroad, a member of the Chicago Plan commission, and the American Iron and Steel institute, as well as numerous other organizations.

Henry M. Spencer, president of the Spencer-Smith Machine Co., and of the Howell Electric Motor Co., Howell Mich., died recently. Mr. Spencer was active in civic betterment.

Edward Townsend Schoonmaker, an artist and designer in brass and iron for many years conected with J. B. Sargent & Co., New Haven and New York, died May 27 at his home in South Orange, N. J. Mr. Schoonmaker was 73 years of age.

Levi Rawson Greene, who for 54 years was consulting engineer for the Walworth Mfg. Co., Boston, died at his home in Cambridge, Mass., June 4, at the age of 91. He was a member of the American Society of Mechanical Engineers.

Frank C. Simmons, aged 39, formerly superintendent of the coal mines in Fayette county, Pennsylvania of the H. C. Frick Coke Co., died June 4 in St. Francis hospital, Pittsburgh, of paralysis caused by being shot in the back July 11, 1919 by a coal miner whom he had discharged.

Arthur J. O'Leary, president and founder of the Arthur J. O'Leary & Son Co., Chicago, manufacturer of iron and steel products, died recently. He was 87 years old having been born in England in 1838. He came to Chicago in 1868 and in 1874 founded the company. Mr. O'Leary was a charter member of the Chicago branch of the National Metal Trades association.

Charles W. Dambacher, 70 years old, for 13 years superintendent of the North Side foundry of the H. B. Smith Co., Westfield, Mass., until his retirement some years ago, died at his home in that city, June 5, following several months illness. He was formerly superintendent of the Dominion Cartridge Co., Brownsburgh, Can.

Frank C. Caine, president of the National Concrete Fireproofing Co., Cleveland, who died at his home in Cleveland, June 7, began his business career with the George Worthington

CLYDE MITCHELL CARR

Co., of that city. He left the Worthington company to form the concrete building company of which he was active head until 10 years ago. He was associated with many business and social clubs.

Chauncey Clark Baldwin, vice president and general manager of the Standard Underground Cable Co., Perth Amboy, N. J., and for 20 years a prominent resident of that city, died at his home there June 7. He was president of the Perth Amboy Industrial association, of the board of water commissioners and of the East New Jersey club and also a director of the local First National bank.

William J. Woodside, former member of the firm of Shinnick, Woodside & Gibbons of the Union Foundry, Zanesville, O., died recently. He was 92 years old. At the age of 17 he became an apprenticed foundryman in the Fracker foundry at Zanesville and in 1865 became a member of the Shinnick, Woodside & Gibbons Union Foundry. In 1893 he sold his interests in that company and retired.

Chauncey C. Baldwin, operating vice president in charge of the wire, cable and rolling mill plant of the Standard Underground Cable Co., at Perth Amboy, N. J., died June 7, at about the age of 55. Mr. Baldwin, who originally constructed the works, was in charge of the plant for about 20 years. In addition to the construction of the Perth Amboy plant, he built the Hastings mills of the National Conduit & Cable Co. and the Waclark mill.

Oscar Richey, president of the Kelly Nail & Iron Co., Ironton, O., died May 29 at his home in Ironton, from the effects of an illness from which he had suffered for some time. He was 76 years old, and retired from active work about a year ago. In addition to being interested in the Kelly company, Mr. Richey was vice president of the Ward Lumber Co., president of the First National Bank, and vice president of the Yellow Poplar Lumber Co., all of Ironton.

Car Loadings at Peak Yet Surplus Rises

Washington, June 12.—Although revenue freight loading of the railroads soared to 1,014,029 cars in the week ended May 26, a total exceeded only twice in history, the railroads continue to increase their car surplus. In the May 23-31 period the daily average surplus of freight cars was 32,443 and the daily average shortage 16,277, making the net surplus 16,166. The net surplus from May 23-31 was 2115 cars.

The loading of 1,014,029 cars of freight in the week ended May 26 was only 4510 below the high mark, which was hung up in the week ended Oct. 14, 1920. Loading of ore in the week ended May 26 went up to 70,119 cars, while coke decreased 470 cars to 15,000. Demand for coal cars is slightly in excess of supply and there is a shortage of this class of equipment, but the boxcar supply daily exceeds the demand by more than 13,000.

"Peaceful picketing" is permitted in Wisconsin under an amendment to an existing law which has been adopted by the legislature and signed by the governor.

Tin Mill Workers

Now on Sheet Scale Wage Basis—Radical Change Made

Youngstown, O., June 12.—One of the outstanding changes brought about in the annual wage and rule settlement negotiated in Atlantic City recently between sheet and tin plate manufacturers and representatives of the Amalgamated Association of Iron, Steel & Tin Workers was the changing of the tin scale preamble to that of the sheet scale preamble.

This radical departure of basing the tonnage returns of tin mill and tin house workers on the average selling price of black sheets instead of the average sales price of a base box of tin plate was adopted partly as an experiment and after much deliberation, on the recommendation of the employers. They contended that as they have no control over the price of pig tin produced in foreign countries and which is subject to great fluctuation, the average price of tin plate is not a fair basis to figure wages. It has caused much dissatisfaction especially in plants in which both tin plate and sheets are produced that sheet workers received advances while wages of tin workers were reduced or remained stationary.

Figuring back over a period of seven years, it was shown that with few exceptions the workers would have obtained more money, more evenly distributed in keeping with the cost of living, had their wages been figured on the sheet basis instead of the tin basis. The general average of the seven years would have netted the workers between 2 and 3 per cent higher for the entire period.

The new arrangement provides that without touching the basic prices for the gages and their division between the members of the crew, the tin workers will receive 1.5 per cent increase for every 5 cents increase in the average sales price of 26, 27, 28 gage black sheets above $2.15 per 100 pounds. Tin house workers figured on the same base scale will receive an increase of 1 per cent with every point, or 5-cent increase in the sales price. The new scale was made retroactive to June 1, thereby giving the tin mill workers an addition of 11 per cent in wages as the tin mill wage figured on the old basis was 23 per cent above base with sheet wage 37 per cent above base rates.

Following the sheet tin wage conference, the bar iron conference was held, the most important result of which was the advance of $1 per ton in the base rate of boiling, or puddlers' wages. The new base rate will be $7 and slight rearrangement of the advances per point will be made. Only minor changes were made in the muck mill, guide mill and 10-inch mill scales. They include an extra 10 per cent for a muck mill crew making less than 30 tons per crew in a pay period, an extra 10 per cent for finishing mill, guide mill and 10-inch mill crews when working less than 5/16-inch squares or rounds, and an extra 5 per cent when working rounds and squares between 5/16 and ½-inch thick. Stranders on guide mills were given an increase of 10 per cent over wages now prevailing. The new agreement is effective July 1.

Steel Consumer Begins Own Barge Service

Pittsburgh, June 12.—The Kelly Axe Mfg. Co., Charleston, W. Va., last week sent its powerboat with a tow of two empty barges to the river terminal here of the Jones & Laughlin Steel Co., where 700 tons of steel bars for use in the manufacture of tools and other equipment by the Kelly company were loaded June 9 under the supervision of Garrad Kelly, son of the president and an official of the company. Mr. Kelly said this was the first time Pittsburgh steel products have been barged up the Big Kanawha river and it was the intention of his company to maintain a regular service between Charleston and Pittsburgh at the rate of two barges every two weeks.

The powerboat used is the newest product of modern river development and has just been completed by the Charles Ward Engineering Co., Charleston, W. Va. It is 106¼ feet overall, 22½-foot beam, and 4 feet deep. It is especially designed for handling light draft barges in comparatively shallow water. The machinery consists of a 200 horsepower, 4-cylinder Fairbanks-Morse engine, directly reversible. The boat has a gasoline generator furnishing current for electric lighting and for an electrically operated steering gear; auxiliary gasoline driven air compressor for furnishing air to start the engines; living quarters on the main deck and a galley.

Dismantle Bar Mill

The bar iron plant at Joliet, Ill., formerly owned by the Fred Cowin Co, is being dismantled by Briggs & Turivas, Chicago, who brought it several months ago. The rolling mill equipment is being offered to other bar iron manufacturers. The mills include an 8-inch to 12-inch combination finishing mill a 12-inch and 16-inch finishing mill and 22-inch muck mill. Such of the equipment as is not sold for use is to be scrapped.

Rail Betterments Total More Than Billion

Washington, June 12.—Authorizations for 1923 plus the carryover from 1922 for railroad improvements aggregate more than a billion dollars, the bureau of railway economics has reported to the interstate commerce commission. The expenditures for locomotives by Class I railroads are placed at $197,47,045, for freight cars $415,209,512, for passenger cars $50,916,323, for other equipment $12,944,392, for additional tracks and improvements to tracks $121,933,563, for heavier rails $27,028,562, for additional ballast $11,040,013, for shops and engine houses, including machinery and tools, $57,363,507, and for all other expenditures $214,789,387, making a grand total of $1,108,672,304. Expenditures for roads not reporting are estimated at $13,176,369. The mileage of these roads is 6956, compared with 234,155 for the roads making reports.

Andrew Fletcher and S. M. Vauclain, presidents of the American Locomotive Co. and the Baldwin Locomotive Works, respectively, have informed the commission that they can deliver in 1923 all the locomotives now on their order books. W. G. M. Goss, president of the Railway Car Manufacturers' association, has advised the commission that all cars on order can be delivered by the builders, with some excess capacity in some car works.

Gets Brazilian Ore

Washington, June 12.—Brazilian exports of manganese from Jan. 1 to April 18 totaled 98,018 metric tons, of which the United States took the major tonnage, Commercial Attache Schurz at Rio de Janeiro has reported to the department of commerce. In January and February shipments to the United States aggregated 31,500 tons.

Lowers Coke Consumption

With a production of pig iron averaging 1906 pounds of coke per ton of iron, the Benson furnace of the Ford Motor Co., Rouge plant, Dearborn, Mich., has established a new record for the low consumption of coke. The average tonnage of the furnace was 524 tons per day and the iron had a silicon content of 3.25 per cent and sulphur 0.026 per cent.

The Maxon Mfg. Co. 69 Wisconsin street, Milwaukee, has filed a petition in bankruptcy. It was organized several years ago by Glenway Maxon Jr. Liabilities are given as $9454 and assets of $11,311 are claimed.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE stockholders of the Aetna Nut Co., Southington, Conn., have voted to sell all the real and personal property and terminate its corporate existence. It is a $150,000 corp., organized in 1868, the officers being: President, James H. Pratt; treasurer, Paul B. Kennedy; secretary, James W. Upson. The company operates an iron works with three bushelling furnaces, an 18-inch billet and 8-inch and 10-inch merchant mills. The plant has a capacity of 42,000 tons annually of bar iron.

* * *

THE Canadian Fairbanks Morse Co., Ltd., was recently commissioned by the Oliver Machinery Co. as its sole representative in Canada in the sale of its woodworking machinery and machine tools.

* * *

THE TOBRIN TOOL CO., Southington, Conn., which was incorporated May 25, with $100,000 capital was organized by the election of William S. Thomson as president, Joseph C. Brannin, Hasbrouck Heights, N. J., as vice president and secretary, and Robert W. Pain, Meriden, Conn., as treasurer.

* * *

AGREEMENT of preferred and common stockholders on a reorganization plan that will protect the interests of both is expected to end soon the receivership of the Defiance Machine Works, Defiance, O., in effect more than a year. A $600,000 bond issue will pay the indebtedness.

* * *

EXCAVATION work has been started for a 4-story building at the corner of Forth street and First Avenue, Columbus, O., to be occupied by the Jeffry Mfg. Co., makers of elevating, conveying and mining machinery. The new building will have 60,000 square feet of floor space. The company is also preparing a parking space for employes on a vacant lot near the new building.

* * *

REORGANIZATION of the Allith-Prouty Co., Danville Ill., has been completed. The new organization will operate under the name of the Allith-Prouty Co. but it is chartered under the laws of Delaware instead of those of Illinois. Officers are: President, Donald E. Willard; vice president, William S. Furry and secretary and treasurer, Carl L. Liebau. The company manufactures hardware.

* * *

ROBERT H. Hassler, Inc., maker of shock absorbers, Indianapolis, Ind., has announced plans for the construction of a new 3-story building at a cost of $100,000 and the purchase of the plant formerly occupied by the Capital Rattan Co. The Rattan plant adjoins the present Hassler plant on the west and was purchased at a cost of $50,000. The new building, which will be of brick and steel construction, will not be started until next year.

* * *

HIRAM SWANK'S Sons, Inc., Johnstown, Pa., now is converting its Clymer plant to the manufacture of runner brick, sleeves, nozzles, etc., beginning operations June 8. The capacity of the plant is sufficient to supply the needs of this class of refractories for the entire country, according to the company's announcement. The plant is thoroughly modern and has Pennsylvania and New York Central railroad shipping connections.

* * *

EDGAR T. WARD'S Sons Co., Newark, N. J., is concentrating its New York, Brooklyn and Newark warehouses on Newark property at 394 Frelinghuysen avenue, where it has Pennsylvania railroad sidings and other facilities. It is erecting a new building, having let a contract to the Austin Co., Cleveland, for the construction of a warehouse structure, 96 x 374 feet. It has placed orders for practically all needed equipment for the new structure.

* * *

B. F. STURTEVANT Co., Hyde Park, Boston, has purchased the plant of the Wisconsin Engine Co., Corliss, Wis. The plant which has been devoted to the manufacture of Corliss engines covers early 10 acres and has 150,000 square feet of floor space. A full manufacturing and engineering staff will be maintained at the Wisconsin plant under direction of Harry W. Page as general manager. The Sturtevant company manufactures blowers, fans, dust exhausting system and air conditioning equipment.

* * *

CHANGES occasioned by the death of William J. McClain, a member of the firm of Waldo, Egbert & McClain, Inc., Buffalo, selling agents for pig iron, coke, coal, etc., have been announced. Directors of the company now are John H. Bradley, Ward A. Wickwire, A. C. Newell, Fred J. Waldo and Justus Egbert. Officers are: President, Fred J. Waldo; vice president and treasurer, Justus Egbert; second vice president, Loring G. Calkins; secretary, Elmer E. Finck and assistant secretary M. F. Selbert.

* * *

PROVISION for expansion has been made by the Esterline-Angus Co., Indianapolis, Ind., in the purchase of the Highway Tractor plant in Speedway City near Indianapolis. The plant includes a site of about two acres and a steel and brick factory building 100 x 200 feet and having a floor space of 24,000 square feet. Expansion plans of the Esterline-Angus Co., call for the purchase of additional machinery for the new plant. Additional floor space will be provided as demands require. The company which manufactures graphic meters used in testing power devices in various lines of industry, will move to the new quarters in about two weeks.

* * *

DECENT announcement has been made of the incorporation of the Steelcraft Parts Co., Cleveland for $100,000 with the following officers: Charles L. Wasmer, president; Carl E. Kramer, vice president; John C. Wasmer, secretary and James J. Lally, treasurer. The new company will take over the plant of the Structural Tool Co., 3160 West 106 street and will manufacture structural steel tools including rivet sets, chisel blanks, pistons for riveting and chipping, hammers, chisel bushings, punches and punch dies, hardened and ground bolts. The officers of the new company are the same as those operating the Cleveland Wrought Products Co., 3590 West Fifty-eighth street.

Defer Buying on Railroad Lists

Inquiries for Tools Appear in Fair Volume but Prospective Purchasers Are Slow To Close—Automobile and Textile Industries Are Not Active in Tool Market—Westinghouse Wants 75 Tools

REPORTS from the leading centers in the machine tool trade indicate that buying continues on a conservative basis. Some dealers believe that the volume of June business will equal that of May, which was a relatively good month. On the other hand, a number of close students of the market predict that activity in the market will reflect dullness until after the midsummer period.

Railroad inquiry for fair-sized lots of new equipment is noted in the New York and Chicago markets, but, except in a few cases, there is no definite sign that tools will be bought against the lists for some time. Among the few exceptions are the Sante Fe, which is expected to close soon, and the Denver & Rio Grande, which is seeking equipment for its Denver shops. New inquiries from eastern roads include those from the Central Railroad of New Jersey, the Lehigh Valley, the Pennsylvania and Norfolk & Western. The list put out by the Central Railroad of New Jersey calls for about a dozen tools, including some heavy smith shop and boiler shop equipment.

That the General Electric Co. is a persistent buyer in the machinery market is again evidenced by its further inquiry for tools, including boring mills. The Otis Elevator Co. is seeking equipment for a new addition to its Quincy, Ill., plant. The latest list of the Westinghouse Electric & Mfg. Co. comprises 75 to 80 items for its Sharon, Pa., plant, which is being equipped for transformer work. The Shenango Furnace Co. will require equipment for replacement at its Sharpsville, Pa., furnaces.

Dealers report that demand from the automobile industry is unusually light, while manufacturers in New England, who look to the textile industry for the sale of a large portion of their product, declare that a slump in that industry is affecting the tool market adversely. As usual, the backbone of current business is the fair volume of small orders, involving one or at most a few items.

Prices remain firm, and in a few instances slight advances have been made. Most of these higher quotations are simply belated revisions to bring prices up to the level established by the majority of builders a few weeks ago. One manufacturer increased the price of disk grinders 10 per cent during the week.

The crane market is buoyed up by a fairly active demand for locomotive cranes, but actual orders during the week were unusually small in number. A medium volume of business is being done in foundry equipment, particularly in molding machines and accessories.

Bulk of Current Business Is In Small Lot Sales

NEW YORK, June 12.—Although machine demand can hardly be described as brisk, an improvement is noted in the local market. Railroad inquiry continues a feature. In addition to the two large lists for the Norfolk & Western and American Locomotive Co. reported recently as pending, the Central railroad of New Jersey has again entered the market for several machines and the Lehigh Valley is taking tentative figures on a small list. The General Electric Co., Schenectady, N. Y., is figuring on some additional equipment, including some boring mills, and the Otis Elevator Co., this city, is expected in the market shortly for equipment for a new addition at Quincy, Ill. An increase of approximately 10 per cent in some lines of disk grinders is the principal price development.

Included in the list of the Central railroad of New Jersey are a horizontal bending and forming machine, a 48-inch car wheel borer, a 26-inch gap punch and shear, a 3300-pound steam hammer, a 5-foot radial drill, and two lathes. The Lehigh Valley is inquiring for an engine lathe, a guide grinder, a horizontal spindle rod milling machine, a vertical spindle rod milling machine, a 32-inch crank planer, and a locomotive driving box boring and facing machine.

Calendar and Selected News of Plant Liquidations, Wholesale Offerings, Auctions and Sales of Used and New Equipment, Etc., Page 96.

While fewer orders have been reported during the past week, the tone of the crane market continues good, with considerable business pending. This is particularly true with regard to locomotive cranes. It is understood that the list of six 70-ton electric overhead cranes for the Baldwin Locomotive Works may be held up indefinitely.

While considerable inquiry is pending in this district, buying of foundry equipment during the past two weeks has slowed up. Foundry operations are maintained at a good rate and considerable casting business is in sight. Nevertheless, foundrymen manifest a tendency to hold off.

New projects are not appearing in the number of a month or so ago. The Essex Brass Foundry, Boston, has recently acquired property for a new foundry, the Richmond Radiator Co., Uniontown, Pa., is building a new plant and the Singer Mfg. Co., Elizabethport, N. J., contemplates a new foundry addition; nevertheless, new construction at the moment is light. The Thatcher Furnace Co., Newark, N. J., has been a recent buyer of equipment, including a number of ladles which went to the Whiting Corp. The American Brake Shoe Co. reported recently as in the market for equipment for a new plant at Portsmouth, Pa., has closed on cupolas, charging cars, dust arresters, ladles and other items to the Whiting Co. The Irvington Smelting & Refining Co., Irvington, N. J., has closed on a 5-ton electric crane, 20-foot span, to the same concern. The Palmyra Foundry Co., Palmyra, N. J., is erecting an addition to its iron foundry and at present is figuring on some miscellaneous equipment. The Norfolk & Western railroad is inquiring for two jar molding machines. The American Radiator Co. has closed on a 20-ton locomotive crane to the Industrial Works. The American Car & Foundry Co. has also been a buyer of conveying equipment is closing on a 15-ton electric crane, 60-foot span to the Champion Engineering Works. The crane is

for its St. Louis plant. The American Car & Foundry Co. is also installing crane equipment at its Chicago plant.

Tool Market Is Quiet

CLEVELAND, June 12.—Inquiry for machine tools seems to have fallen off slightly in volume. While May was an exceptionally good month, most manufacturers and dealers are hesitant in predicting an equally large volume of sales for June. A number of dealers look for restricted operations until August or September.

On the other hand, a few dealers and manufacturers report that business thus far in June indicates the month will average as well as May.

Among the inquiries recently placed in this district are one from the Pennsylvania railroad for four machines, one from the Norfolk & Western for six machines, and a few small lists for one or two items. Most of the equipment being sold is going singly or in small lots. Manufacturers are selling drills, turret lathes and special machinery in small lots which in aggregate comprise a fair volume. A surprisingly small amount of this business originates with the railroads and automobile industry; most of it can be traced to companies engaged in general manufacturing.

The used machinery market is practically unchanged since last week. A large lathe has been sold to a western Pennsylvania user and a number of used tools have gone to a fabricator in the Chicago industrial section. Sales in northern Ohio are mostly of single tools.

Volume of Business Fair

TORONTO, Ont., June 11.—A fair volume of business was done by dealers and builders in machine tools and equipment during the week, but orders closed were chiefly for one or two machines. Bids are in for a big list of equipment for the Toronto Transportation commission to equip a new car shop, but contracts have not been placed.

Pulp and paper companies are furnishing a good demand for machinery both for new plants and for additions to present ones. The numerous electrical development projects now under way or about to be started has brought forth a big demand for electrical equipment. The Dominion Engineering Works, Ltd., Lachine, Que., has considerable business on its books and is working to capacity in its three departments.

Prices Hold Firm

BOSTON, June 12.—In the face of declining prices in other lines, new machine tools are holding firm at established levels. In fact, during the past week two advances have been made by tool manufacturers. One, a Wisconsin manufacturer, has advanced prices on disk grinders about 10 per cent. The other, a manufacturer of lathes, has brought his price into line with previous advances by another lathe manufacturer. Used tools also are holding up well in price despite the small amount of trade. Here and there a forced sale brings out an unusually low figure. The principal dealers say that price cutting is not general and that most sales are determined more by other conditions than price. A slump in activity at textile mills has been one of the most serious setbacks in the New England machine tool trading. Textile machine manufacturers, are, however, all busy. A central Massachusetts manufacturer bought three or four special tools during the week representing a total outlay of over $11,000. The Pittsfield, Mass., plant of the General Electric Co. is inquiring for two special lathes. Another plant in Massachusetts is in the market for a 20-ton crane. Two New England schools are receiving bids on miscellaneous equipment mostly woodworking machinery.

Lull in Market Noted

CHICAGO, June 12.—With the exception of the large total of machine tools pending on railroad inquiries, the market at Chicago is quiet and sales are in much less volume than earlier in the year. This lull is marked and has been in force for several weeks without a definite sign of activity being resumed. While there are numerous single tools and small lots under negotiation, buyers appear to lack interest. One explanation is the present level of prices, which is regarded by many dealers as higher than conditions warrant and beyond the figure at which users will close.

Crane Awards and Inquiries of the Week

Orders Placed

One 33-foot span electric traveling crane for Hubbard & Co., Pittsburgh, to the Northern Engineering Works.

One 25-ton, 47-foot span alternating current overhead traveling crane and one 5-ton, 77-foot span direct current electric traveling crane for the Detroit Steel Corp., for the Northern Engineering Works.

One 15-ton used Browning crane for Small & Costello, New York City, to Hoisting Machinery Co.

Nine electric cranes for the American Type Founders Co., Elizabeth, N. J., to the Shepard Electric Crane & Hoist Co.; five are of two tons capacity, three of one ton capacity, and one of three tons capacity.

Five electric cranes and one trolley for the American Locomotive Co., to Manning, Maxwell, Moore, Inc., Pittsburgh.

Electric Crane Co. Specifications call for one 15-ton, and one 10-ton electric crane, and one 10-ton trolley for Schenectady, N. Y.; and two 5-ton gantrys and one 10-ton electric crane, 67-foot span, for Chester, Pa.

Three locomotive cranes for the Big Four railroad, as follows: One 35-ton crane to the McMyler Interstate Co.; one 30-ton crane to the Ohio Locomotive Crane Co.; and one 30-ton to the Orten & Steinbrenner Co.; all are to be equipped with 1½-yard buckets.

One 20-ton locomotive crane for the Empire Engineering Co., Baltimore, to the Browning Co.

Three 25-ton locomotive cranes for the Morris County Crushed Stone Co., Morristown, Pa., to the Browning Co.

One 20-ton locomotive crane for the Halcomb Steel Co., Syracuse, N. Y., placed by the Crucible Steel Co. of America, New York City, with the Browning Co.

Two 5-ton electric cranes, 28-foot span, for the Philadelphia Rapid Transit Co., Philadelphia, to Alfred Box & Co.

One used 15-ton Niles crane for the Simmonds Machine Co., Albany, awarded an unnamed seller.

One 25-ton electric crane, 67-foot span, for the Southern Pacific railroad, to an eastern builder; this is in addition to the two cranes reported last week as placed.

Two 20-ton handpower cranes, 57-foot span, for the Honolulu Iron Works, Woolworth building New York City, to Whiting Corp.

10 one-ton I-beam trolleys with beams, rails, etc., for the Westinghouse Air Brake Co., Wilmerding, Pa., to Manning, Maxwell, Moore, Inc., Pittsburgh.

One 5-ton overhead traveling crane for the Pittsburgh Spring & Steel Co., Pittsburgh, to Manning, Maxwell, Moore, Inc., Pittsburgh.

One locomotive crane for the Pennsylvania railroad, Pittsburgh district to the Brown Hoisting Machinery Co.

Orders Pending

One 40-ton locomotive crane for the Union Carbide Co., New York City, pending.

One 12½-ton locomotive crane for the Worthington Pump Machinery Co., Harrison, N. J., bids asked.

One 5-ton electric crane, 14-foot span; one 6-ton transfer type crane, 11-foot, 6-inch span; and one 2-ton and one 1-ton crane, both of 17-foot span, for Jenkins Bros., Bridgeport, Conn.; Lockwood, Greene & Co., Boston, engineers in charge.

One 10-ton electric crane, 47-foot span, for Westinghouse Electric & Mfg. Co., Philadelphia, bids asked.

Six 70-ton cranes for the Baldwin Locomotive Works, Philadelphia; action may be postponed indefinitely.

A number of hoists to be bought at later date by Ophuls & Hill, New York City, for Havanna, Cuba, ice plant, instead of 30 small cranes as previously reported.

One 25-ton locomotive crane with special features for Duquesne works, Carnegie Steel Co., Pittsburgh; now in purchasing department for decision.

One 30-ton locomotive crane for the Mingo Junction, O., plant of the Carnegie Steel Co., Pittsburgh; action about to be taken.

Two 25-ton locomotive cranes; inquiry issued this week in Pittsburgh; understood to be from the Vang Construction Co.

One crane for the Pittsburgh Steel Products Co., Monessen, Pa., prompt action to be taken.

One 5-ton crane for the Reliance Steel Casting Co., Pittsburgh; order expected to be placed this week.

One 20-ton locomotive crane for the Stewart Machinery Co., Portland, Ore.; telegraphic inquiry received in Pittsburgh this week.

The Santa Fe railroad has given assurance that it will place its orders on the pending list within a short time. Most of this equipment is of the lighter type for roundhouse use. The Denver & Rio Grande is also about to close on its inquiry for equipment to go into its Denver shops. At recent auction sales of machine tool equipment, unusually high prices were bid, especially for tools of wide application. Some dealers who intended to bid at these sales found the level of quotations too high for them to participate. Many consumers are willing to consider second hand tools when prices show a wide spread from those quoted on new machines.

Defer Equipment Buying

PITTSBURGH, June 12.—Buying of new machine tool equipment for the most part is deferred, although the Westinghouse Electric & Mfg. Co., East Pittsburgh, continues its activity. Its latest list comprises 75 or 80 items for the Sharon, Pa., plant which it is fitting up to do transformer work. The list includes many small item like hand shears, considerable plate machinery and lathes, shapers, milling machines, etc. Nothing more is heard concerning the lathes for the Conway, Pa., shops of the Pennsylvania railroad.

Sellers of new equipment report the disposal of an odd machine now and then, some sales involving two or three tools at a time. One representative dealer states that June so far compares favorably with May which for him was the biggest selling month since the war.

Recent sales involve lathes, shapers and other standard equipment. Other dealers state that the atmosphere is better than it was two or three weeks ago and expect that before long a real buying movement will ensue. One dealer states that he sold this past week other smaller items, including two motor driven turret lathes and some motor driven sheet metal working machinery. The Shenango Furnace Co., probably will buy some machinery for replacement purposes at Sharpsville, Pa.

Sales in the used machinery market continue to be made at some distance from Pittsburgh. For instance, one dealer sold a large power hammer to an Ohio user and a 28-inch shaper to a West Virginia user along with hacksaws, pipe machines, drills, etc., nearer home. It is negotiating for the sale of a large boring mill in Washington. Another sold a radial drill in Kansas, while a third is this week showing machinery on the floor to a customer from California. A list of eight or 10 used machines now current comes from the Booker-Smith Co., in West Virginia near East Liverpool, O.

The foundry equipment market is fairly active, particularly from a molding machine standpoint. The Herman Pneumatic Machine Co., reports the receipt of numerous inquiries, apparently the result of the recent Cleveland foundry equipment exhibition. Recent buyers include the Harbison Walker Refractories Co., three; Keystone Iron & Steel Works, Los Angeles, Cal., two; several from the Lloyd-Burnham Corp., Lancaster, Pa.; and one each from the following: the American Radiator Co., Buffalo; the Ohio Steel Foundry Co., Lima, O., the Huntzpillar Mfg. Co., Boston; American Cast Iron Pipe & Foundry Co., Birmingham, Ala.; National Brake & Electric Co., Milwaukee; the American Woodworking Machinery Co., Rochester, N. Y.; the Joseph Reid Gas Engine Co., Oil City, Pa.; and the Brighton Electric Steel Casting Co., Beaver Falls, Pa.

Some activity is noted in the locomotive crane market, although sales of electric overhead traveling cranes are somewhat slow. The Carnegie Steel Co., wants locomotive cranes, one each for Duquesne, Pa., and Mingo Junction, O. The Pennsylvania railroad just purchased one and the Vang Construction Co., is understood to be in the market for two. Two or three overhead cranes are pending.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

CHESHIRE, CONN.—The Shattuck-Jones Co., Inc., has been incorporated to build machinery with $50,000 capital by F. A. Shattuck, E. A. O'Rourke and A. C. Sullivan, Waterbury, Conn.

DARIEN, CONN.—The Wing Sales Co., Inc., has been incorporated to build engines with $5000 capital by H. K. Boice, B. B Wing and Paul Wing.

HARTFORD, CONN.—The Townsend Mfg. Co., Walnut street, has awarded a contract for the erection of a 2-story addition.

NEW BRITAIN, CONN.—The American Hardware Corp. has let the contract for a brick, 2-story factory addition to its P. & F. Corbin branch to cost $35,000.

NEW HAVEN, CONN.—The Dutee-Wilcox-Flint Co., Inc., 51 Broadway, has awarded a contract for the erection of a 1-story addition, 50x170 feet, to cost about $45,000.

SOUTHINGTON, CONN.—The Tobin Tool Co., Inc., has been incorporated with $100,000 capital by William S. Thomson, Joseph C. Bannin, Hasbrouck Heights, N. J., and Robert W. Paine, Meriden, Conn.

HAMILTON, GA.—Thomas M. Walker is organizing a company to build a plant for the manufacture of brick, tile and kindred products. A power house will be installed.

CHICAGO—The Chicago Nipple Mfg. Co., 1966 Southport avenue, has purchased a 2-story factory building and will utilize it for a pipe bending plant.

CHICAGO—The Art Lamp Mfg. Co., 6 North Franklin street, has bought a 7-story building and will utilize it for the manufacture of lamps.

CHICAGO—The Mills Vending Machine Co., 52 North Kedzie avenue, has been incorporated with $40,000 capital stock by H. G. Wheeler, Frank W. Mills, and Roger J. Marcy. The company is represented by Andrew J. O'Donnell, 32 West Washington street.

CHICAGO—The Ornamental Brass & Fixture Co., 728-730 West Randolph street, has been incorporated with $10,000 capital stock by Frank Goldberg, Mitchell Edelson, and Rose Benjamin. The company is represented by Edelson & Tannenbaum, 111 West Washington street.

DIXON, ILL.—The Reynolds Wire Screen Co. has plans for a contract for the erection of an addition to cost about $50,000.

PEORIA, ILL.—The Sly Machine Supply Co., 729 South Washington street, has been incorporated with $25,000 capital stock by Marshall Rask, William S. Kellogg and John C. Schleich. The company is represented by Weil, Bartley & Weil, Jefferson building.

DECATUR, IND.—The Gerber Ladder Co.

Firing your furnace with $5 bills

WHERE YOUR FUEL GOES!

Fuel Oil

Powdered Coal

Blast Furnace Gas

For every hundred dollars spent on fuel, the amount represented by the dark sector of these diagrams is thrown away in the flue gases.

The diagrams presume that the gases leave the furnace at a temperature of 1600 degrees Fahrenheit. A lower temperature somewhat reduces the loss; a higher increases it.

Most of this waste heat can be salvaged by a Calorized Recuperator.

Take five or six nice new five dollar bills for each hundred dollars you spend on fuel for your industrial furnaces. Then burn the bills in one of the furnaces.

"Crazy!" you say. Exactly! But you are doing just this in every non-recuperative, or non-regenerative, furnace in which the operating temparature exceeds 1200 degrees Fahrenheit. Nothing but recuperation, or regeneration, can stop this waste.

A calorized Recuperator simply and positively retrieves the greater part of this waste heat. It also makes possible accurate temperature control, and materially improves combustion.

A reduction of 15 to 30 per cent in your fuel consumption will interest you, or someone in your organization. The coupon brings a straight forward and accurate analysis of furnace costs which may surprise you.

CALORIZING

What it is:—

Calorizing is a process, patented by the General Electric Co., in which aluminum is driven into steel tubes so as to form aluminum alloy surfaces. Tubes so treated will successfully withstand high temperatures.

A Calorized Recuperator can be readily applied to the great majority of furnaces, large or small, old or new.

Clip this coupon

The Calorizing Company
Oliver Building, Pittsburgh

Information which will enable me to determine the fuel I can save with a Calorized Recuperator interests me.

Name:_____ Position:_____

Company Name:_____

Address:_____

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	3.85c
New York	3.54c
Philadelphia	3.55c
San Francisco	4.00c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	3.95c
New York	3.64c
Philadelphia	3.65c
San Francisco	4.10c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	3.65c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.45c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.90c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.00c
Seattle	4.75c
St. Louis	4.45c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.75c
Buffalo	5.25c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.75c
Detroit	5.15c
Los Angeles	6.50c
New York	5.15c
Philadelphia	5.15c
San Francisco	6.30c
Seattle	5.75c
St. Louis	5.20c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.90c
Buffalo	6.35c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.90c
Detroit	6.30c
Los Angeles	7.30c
New York	6.15c
Philadelphia	6.25c
San Francisco	7.15c
Seattle	6.75c
St. Louis	6.35c

BANDS

Boston	4.80c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	4.60c
New York	4.39c
Philadelphia	4.35c
San Francisco	4.75c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.70c
Buffalo (shapes)	5.20c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angeles (rounds)	5.40c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
San Francisco (rounds)	5.50c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.55c

plans the erection of a 1-story factory building, 60x120 feet to cost about $30,000.

KENDALVILLE, IND.—The McCray Refrigerators Co. will ask for bids about June 15 on a 1-story addition 75x218 feet.

MICHIGAN CITY, IND.—The Josam Products Foundry Co. has qualified to do business here with a capital stock of $50,000. Directors of the company are Rurolph C. Koblitz, Walter K. Greenebaum and Peter J. Spicka.

WASHINGTON, IND.—The Leonard Range Co. plans the erection of a 1-story plant to cost about $100,000.

JEFFERSON, KY.—The Andy Poh Machine Co. has been incorporated with $5000 capital stock by Annie Poh, Andy Poh and Louis Vernholdt.

PORTLAND, ME.—The Sanders Engineering Co. is erecting a 2-unit power plant for the Twin State Gas & Electric Co.

PORTLAND, ME.—The Cumberland Iron & Steel Co. has been incorporated with $10,000 capital by Harris Shimelovich, Frank A. Howard and Frank B. Bodurtha.

BOSTON—The Hopkins Mfg. Co., 80 Boylston street, plans the erection of a plant.

WORCESTER, MASS.—The J. W. Grady Co. has been incorporated to build automobiles, motorcycles, bicycles and accessories with $500,000 capital by James W. Grady, William P. Farrell and T. E. O'Connor.

BALTIMORE—The plant of the Lafayette Mill & Lumber Co., 2100 West Lafayette avenue, recently was damaged by fire.

BALTIMORE—The Porcelain Enamel Mfg. Co. plans the erection of a 1-story factory building, 100x520 feet to cost about $96,000.

DETROIT—The Detroit United Railway Co. plans to rebuild its car shops and barn recently damaged by fire.

DETROIT—Plans are being drawn for a 2-story 24x125 foot addition to the factory and paintshop of the Michigan Copper & Brass Co.

DETROIT—The Spalding Electric Co. is asking for bids for the erection of a 1-story building 40x80 feet to be built at 1344 Michigan avenue at a cost of $18,000.

FLINT, MICH.—J. Dallas Dort, president, Dort Motors Co., recently has announced the sale of the Kalamazoo Body plant to the Checker Cab Co., Chicago. A new body plant probably will be built in Flint.

GRAND RAPIDS, MICH.—The La Mar Pipe & Tile Co. plans to build a plant for the manufacture of cement tile, pipe, etc. The company recently was organized with $200,000 capital stock, by N. H. Battjes, J. Kent Wilson and others.

MENOMINEE, MICH.—The Lloyd Mfg. Co. plans the erection of a 3-story plant addition, 70x400 feet to be built at an estimated cost of $75,000.

MUSKEGON, MICH.—The Shaw Electric Crane Co. has started work on the erection of a 2-story plant addition, 60x100 feet, to cost about $60,000.

HARRISON, N. J.—A metalworking and retinning plant will be established here by the Willard Co., recently organized with $100,000 capital.

HARRISON, N. J.—The Willard Co., 309 Harrison avenue, plans to establish a plant here. Samuel H. Clark and Clarence T. Van Deren head the company.

KEYPORT, N. J.—The Standard Motor Trading Co. plans to install a machine shop in a new 1-story shop building, 170x195 feet, to be built at an estimated cost of $80,000.

NEWARK, N. J.—Jacob Redlinghouse, operating a foundry, has organized with a capital of $100,000, Jacob Redlinghouse, Inc., to take over and expand the present plant.

OXFORD, N. J.—The Oxford Foundry & Machine Co. plans to rebuild the part of its plant recently damaged by fire.

OXFORD, N. J.—Plans are under contemplation by the Oxford Foundry & Machine Co. for construction to replace a portion of its plant recently damaged by fire. The loss, including equipment, is estimated at $30,000.

NEW YORK.—The New York Dock Co., 44 Whitehall street, plans extensions and improvements to its plant to cost about $85,000.

NEW YORK CITY—Plans are being completed by the American Can Co., 120 Broadway, for plant extensions at San Francisco, costing about $1,000,000.

NEW YORK CITY—Appropriation has been made by the board of estimate for $4,500,000 for the erection of a municipal garage, reclamation plant and central repair plant, at Barren island.

ROCHESTER, N. Y.—The F. B. Rae Oil Co., Ambrose street, plans to rebuild the part of its plant recently damaged by fire.

TROY, N. Y.—The Manning Abrasive Co. plans the erection of a new plant to cost about $180,000.

TROY, N. Y.—A $180,000 plant will be erected at Green Island, near here, by the

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

Manning Abrasive Co., now operating a plant at Watervliet, N. Y.

UTICA, N. Y.—C. Sautter, 14 Genessee street, plans the erection of a 2-story machine shop to cost about $50,000 with equipment.

UTICA, N. Y.—Work will be started shortly on a 2-story $50,000 machine shop for C. Sautter, this city.

CINCINNATI—The General Hardware & Supply Co. has been incorporated with $15,000 capital by Clem F. Schmidt, Joseph Silver, Daniel Allen and Charles A. J. Walker.

CINCINNATI.—Plans are being made for the erection of an 8-story building, 50x145 feet on Sixth street at a cost of $400,000. Fosdick & Hilmer, 1703 Union Trust building are the engineers.

COLUMBUS, O.—The Ohio State Stove Co. will further increase the capacity of the plant by the erection of a 3-story building, 90 x 250 feet. M. L. Packer is general manager.

DAYTON, O.—The Columbia Metal Products Co. has been incorporated with $25,000 capital stock by D. J. Maloney, W. H. Johnston, Oliver B. Smith, Joseph F. Goetz and Louis Bamberger.

SPRINGFIELD, O.—The Springfield Spring Co. has awarded a contract for the erection of a plant addition, 31x260 feet to cost about $10,000.

TOLEDO, O.—The Diamond Alloy Tool Co. has been incorporated with $500 capital stock by W. H. Fraser, Wesley H. Brackney, Thomas O. Marlan, A. T. Goorley and A. C. Ruihley.

EBENSBURG, PA.—The Gardner Calculating Machine Co. plans the construction of a 2-story plant to be built at an estimated cost of $75,000.

HAZLETON, PA.—The plant of the Pardee Bros. & Co., recently was damaged by fire.

JEANNETTE, PA.—The Pittsburgh Engineering Co. has awarded contracts for the erection of three additional factory buildings.

LITITZ, PA.—A 1 and 2-story factory addition is planned by Hickman & Williams.

PHILADELPHIA—The Atwater Kent Mfg. Co., 4937 Stenton avenue, plans the erection of a plant unit to cost about $155,000.

PHILADELPHIA—The Energy Elevator Co., 214 New street, plans the erection of a 1-story addition to cost about $15,000.

PHILADELPHIA—The repair shop and service works of the St. Martin's Coal Co., 7600 Germantown avenue, recently was damaged by fire.

PHILADELPHIA—General contract for a $150,000 plant extension for the Atwater-Kent Mfg. Co. has been placed with the Ballinger Co.

PHILADELPHIA—The Campbell Construction Co. has been awarded the general contract for the erection of a $10,000 shop addition for B. Beerwold.

PHILADELPHIA—Plans are being prepared by W. S. Dyer, engineer, for a $600,000, 5-story fireproof bakery and power plant, for J. S. Ivins Sons Co.

PITTSBURGH—The Shenango Furnace Co., Oliver building, plans to rebuild its machine shop recently damaged by fire.

PITTSBURGH—The Standard Spring Co., 2127 Wright street, plans the erection of a 2-story addition.

PITTSBURGH—The Bailey-Farrell Mfg. Co., South Twentieth and Sidney streets, plans the erection of a 2-story plant building to cost about $30,000 at Huntington, W. Va.

POTTSVILLE, PA.—The Eastern Steel Co. plans the erection of an addition to its plant.

WARREN, PA.—The Conowango Co. contemplates the rebuilding of a factory destroyed by fire. The building will be built of brick at an estimated cost of $100,000.

WAYNESBORO, PA.—Plans are being prepared for the establishment of a new plant here by the Waynesboro Nut Lock Co., recently incorporated with $100,000 capital. The company will take over the business of the Bulldog Lock Co., Baltimore, and establish it in the proposed plant.

LYNCHBURG, VA.—The Smith Mfg. Co. plans the establish a plant here for the manufacture of kitchen utensils. The company recently was organized with $100,000 capital stock by R. L. Smith, R. B. Krebbs and others.

CHARLESTON, W. VA.—The Metal Products Co. has been incorporated with $25,000 capital stock by J. T. Flynn, Charles E. Kitchen, Joe L. Silverstein, Sam Silverstein and Arthur Rosenblatt.

Throughout the West

LOS ANGELES—The Hoyt Heater Co. plans to erect a 1-story plant building, 100x125 feet for the manufacture of heaters, etc.

LOS ANGELES—The Bowers Mfg. Co., Inc., has been incorporated to manufacture articles of tin, steel, aluminum, etc., with $60,000 capital stock.

SAN FRANCISCO—The Edmund S. Lancaster Co. has been incorporated to manufacture and deal in machinery with $250,000 capital stock by Edmund S. Lancaster, W. A. DeWitt, William A. Powell, H. F. Swift and others.

BATON ROUGE, LA.—The Standard Machine Co., Inc., has secured a building here, 100 x250 feet, which it plans to utilize for the manufacture of sawmill machinery. J. A. Tinsely is secretary and treasurer of the company.

ST. LOUIS—The Warren Steel Casting Co., 3400 Maury avenue, plans to rebuild the part of its plant recently damaged by fire.

Industrial Business Changes Recently Announced

ANOTHER step toward the consolidation of the Bethlehem Steel Co.'s Pittsburgh offices has been taken in the removal to rooms 936-937 of the Oliver building, the plate and structural shape department, which since the merger of the Midvale Steel & Ordnance Co. with the Bethlehem company has been located in the First National Bank building. The main offices of the company are on the eighteenth floor of the Oliver building.

* * *

The Cedar Tool & Gauge Corp., Inc., Bridgeport, Conn., has changed its name to Lavery & Cotton, Inc.

* * *

Luria Bros. & Co., Lebanon, Pa., scrap iron dealers, have removed their Pittsburgh office from 936-937 Oliver building to suite 630-632 the same building, in charge of J. E. Jacobson, district manager.

* * *

The Matthew Addy Co., dealer in pig iron and coke, has moved its Chicago office from 1901 Peoples Gas building to suite 1043 the same building.

* * *

The Bethlehem Steel Export Corp, has opened a branch office in the Yusen building, Marunouchi, Tokio, in charge of F. M. Gibson.

* * *

Naylor & Co., Inc., New York, has issued an announcement to the effect the Stalnaker Steel Co., First National Bank building, Pittsburgh, has been appointed its representative in the territory formerly handled by its Pittsburgh office. The company's business in fluorspar, ferromonganese, spiegeleisen, chrome ore, wire rods, billets, slabs, sheets bars, and scrap will continued under the direction of S. P. Broome, former Pittsburgh manager of Naylor & Co., who now is connected with the Stalnaker organization.

* * *

Branch offices have been opened at 53 West Jackson boulevard, Chicago, by the North American Mfg. Co., Cleveland. The new offices are in charge of Benjamin Sklovsky, district representative.

* * *

The Standard Scale & Supply Corp., Pittsburgh, recently purchased, and now is operating under entirely different management the business formerly conducted by the Standard Scale & Supply Co.

WABIK METAL

A Special Material-Specially Treated

for

VITREOUS ENAMELING

for Such Parts as

STOVE DOOR PANELS
SPLASHER BACKS
BROILER PANS
TABLE TOPS
REFRIGERATORS
SIGNS
and other flat work

Like all other Mansfield Products, WABIK METAL SHEETS are rolled from our own special "BOTTOM-POURED" INGOTS.

Other Specialties:—

AUTOMOBILE SHEETS

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS
PICKLED and ANNEALED ENAMELING STOCK
For Kitchen Utensils
MILK CAN STOCK

"Mansfield" Steel is the ultimate in Sheet Bars and in Sheets. It means satisfaction to the many users. Constant study of the needs of users, and continuous application of the results of such study, in the way of improved methods in our plants has established a reputation for reliability unsurpassed.

SHEET BARS
INGOTS

Mansfield Sheet & Tin Plate Company

MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

The L. D. Rockwell Co. 1106 National City Bldg., New York, N. Y.
Mr. D. B. Coey, 1018 Standard Oil Building, Chicago, Ill.
Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.
The L. D. Rockwell Co., 1512 B. F. Keith Bldg., Cleveland, Ohio.
The Maynard French Steel Co., 516 Mercantile Library Bldg., Cin., O.
Walter G. Clark, Inc., 215-17 Chestnut St., St. Louis, Mo.
Walter G. Clark, Inc., 1317-19 St. Louis Ave., Kansas City, Mo.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D. C.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.
Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ont., Canada.

LONGVIEW, WASH.—Lytle S. Adams, president of the Spiral Machinery Co., St. Louis, is negotiating for a site for a plant here.

MT. VERNON, WASH.—The Skagit Valley Power Co. has been incorporated with $400,000 by C. J. Henderson and others.

SEATTLE—The Robinson Gear & Machine Works has leased a 1-story building, 60x120 feet, which it will utilize as a machine shop.

SEATTLE—The Westlake Engineering Co. has moved to new quarters at 1722 Westlake avenue, where it has facilities for marine and general repair work.

TEKOA, WASH.—The Liberty Butte Iron Co. has been incorporated with $500,000 capital stock by J. D. McManis, George B. May and C. L. Shulerud.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent	13.25 to 16.50

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	nominal
Algerian low phosphorus, 52 to 54 per cent	nominal
Swedish and Norwegian low phosphorus, 68 per cent	nominal
Swedish foundry or basic, 66 to 68 per cent	11.25
Spanish foundry or basic, 50 to 54 per cent	nominal

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent	nominal
Indian, minimum 47 per cent	42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent	
Caucasian, 53 to 55 per cent.	nominal

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per ton	21.50 to 22.00

Rivets

Structural rivets, Pittsburgh	3.25c
Boiler rivets, Pittsburgh	3.35c
Rivets, 7/16-in. and smaller	60 and 5 off

Nuts and Bolts

NUTS

(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank	$3.00 off list
Hot pressed square or hexagon tapped	$2.75 off list
Cold punched square or hexagon blank	$3.00 off list
Cold punched, square or hexagon, tapped	$2.75 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts 9/16-inch and smaller	70-10-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	45 off
Cut thread	40 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50 off
Cut thread	40-10 off
Larger and longer	40-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	35-5 off
Larger and longer	35-5 off
Lag screws	50 off
Plow bolts Nos. 1, 2 and 3 heads	40-10 off
4 to 10 heads	40-10+20 off
Stove bolts	75-5 off
Tap bolts	25 off
Bolt ends with hot pressed nuts	40-10 off
Bolt ends with cold punched nuts	35-5 off
Blank bolts	40 off
Rough stud bolts with nuts	40 off

WASHERS

Wrought washers	$4.85 to $5.00 off

Steel Pipe

(First column*—effective March 19, 1923)
(Second column—effective April 19, 1923)
*Wheeling Steel Corp. discounts.
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	44 to 45	18½ to 19½
¼ and ⅜-inch	50 to 51	24½ to 25½
½-inch	55 to 56	41½ to 42½
¾-inch	59 to 60	47½ to 48½
1 to 3-inch	61 to 62	49½ to 50½
Lap Weld		
2-inch	54 to 55	42½ to 43½
2½ to 6-inch	58 to 59	46½ to 47½
7 to 8-inch	55 to 56	42½ to 43½
9 and 10-inch	54 to 54	41½ to 41½
11 and 12-inch	54 to 53	41½ to 40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	59 to 60	47½ to 48½
Lap Weld		
2-inch	52 to 53	40½ to 41½
2½ to 6-inch	56 to 57	44½ to 45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	40 to 41	23½ to 24½
¼ and ⅜-inch	46 to 47	29½ to 30½
½-inch	52 to 53	41½ to 42½
¾-inch	57 to 58	46½ to 47½
1 to 1½-inch	59 to 60	48½ to 49½
2 to 3-inch	60 to 61	49½ to 50½
Lap Weld		
2-inch	52 to 53	41½ to 42½
2½ to 4-inch	56 to 57	45½ to 46½
4½ to 6-inch	55 to 56	44½ to 45½
7 to 8-inch	51 to 52	38½ to 39½
9 and 10-inch	45 to 45	32½ to 32½
11 and 12-inch	45 to 44	32½ to 31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	41 to 42	31½ to 32½
¾ to 1½-inch	44 to 45	34½ to 35½
2 to 2½-inch	46 to 47	36½ to 37½
Lap Weld		
2-inch	40 to 41	31½ to 32½
2½ to 4-inch	42 to 43	33½ to 34½
4½ to 6-inch	41 to 42	32½ to 33½
7 to 8-inch	37 to 38	24½ to 25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)

Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

	Black	Galvanized
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	7
2-inch	23	11
2½ to 6-inch	26	13
3 to 6-inch	28	11
7 to 12-inch	26	

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)

(Effective April 19, 1923)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON

(Effective April 12, 1923)

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN

(Effective April 19, 1923)

1-inch	51 off
1¼ and 1½-inch	43 off
1¾-inch	27 off
2 and 2¼-inch	18 off
2½ and 2¾-inch	28 off
3 and 3¼-inch	32 off
3½ and 3¾-inch	33 off
4-inch	37 off
4½ and 5-inch	29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch	34 off
3½ and 3¾-inch	35 off
4-inch	39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	83 off
Carbon, 0.30 to 0.40 per cent	81 off
Carbon, 0.40 to 0.50 per cent	80 off

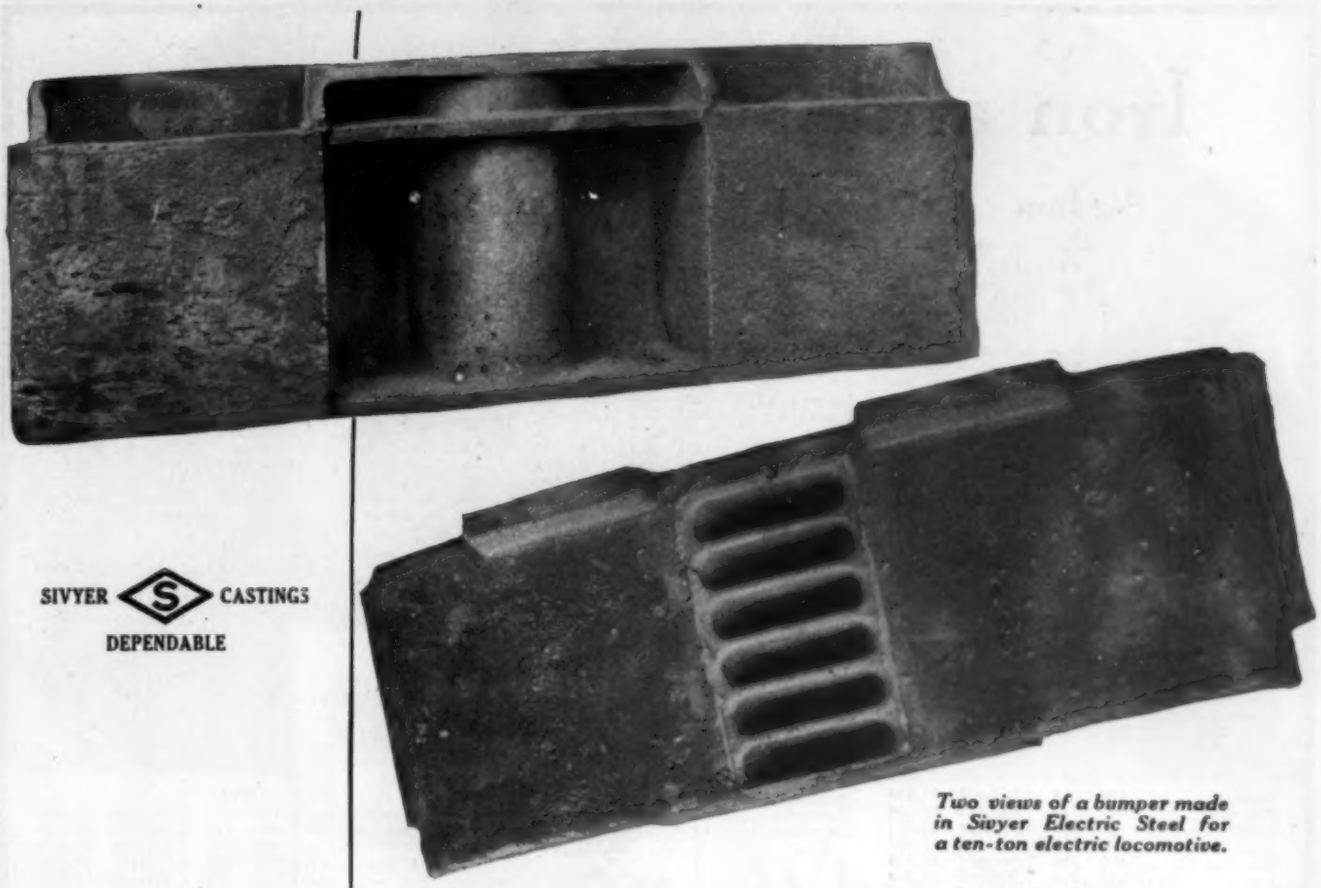
Plus differentials and extras for cutting

SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES

(Effective April 19, 1923)

Outside diameter	Gage	Net prices per foot, f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5½-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.



Two views of a bumper made in Sivyer Electric Steel for a ten-ton electric locomotive.

SIVYER S CASTINGS
DEPENDABLE

Bearing the Brunt of the Hardest Knocks

THE locomotive bumper shown above illustrates how manufacturers of mining machinery are turning to Sivyer Steel even in the simple cases where the only unusual requirement is unusual strength. The manufacturer using this bumper casting originally came to Sivyer because his machining costs were high for certain parts. Sivyer methods solved the many problems involved and gave him uniformly machinable castings. In service they demonstrated such exceptional durability and resistance to wear that he now uses Sivyer Electric Steel for the sake of its superior strength qualities as well as for the sake of keeping down production costs.

Send Blue Prints

If certain parts of your product—which are now either cast or hammer-forged and welded—ought to be more effectively safeguarded against failure in service, send us your blue prints with an explanation of your difficulties. We will be glad to study the problems involved and recommend possible solutions without obligation on your part.

If some of your planing and boring tools require an unusual amount of grinding and replacement, it may be that there are sand and slag on the surface of some of the castings now used. Tools are keen inspectors of castings and originate many of the orders that come to Sivyer from more than a thousand miles away. If your usual sources of supply seem unable to get rid of the trouble, send us your blue prints of the parts in question, together with details about your difficulties. Without obligation on your part we will study the problems of molding practice involved and suggest methods for producing castings with uniformly good machining quality.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Production

Compiled By IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	—Output— Total	Av. daily
1907				
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	
1908				
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,888	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	
1923				
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	424	311	3,547,012	118,233
May	424	322	3,866,386	124,722

Ingots and Castings

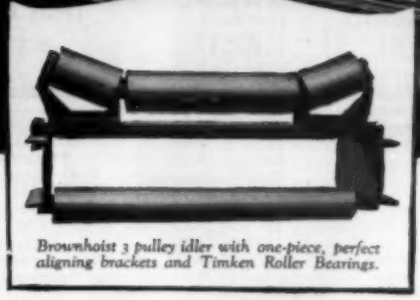
By American Iron and Steel Institute

	Ingots	Castings	Total
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934
1921	19,184,084	559,713	19,743,797

Monthly Ingot Output

Gross Tons

1922	84.13 per cent of capacity	Indicated total
January	1,593,482	1,890,000
February	1,745,022	2,070,000
March	2,370,751	2,820,000
April	2,444,513	2,910,000
May	2,711,141	3,220,000
June	2,634,477	3,130,000
July	2,487,104	2,960,000
August	2,214,582	2,630,000
September	2,373,779	2,820,000
October	2,872,415	3,410,000
November	2,889,297	3,440,000
December	2,779,890	3,300,000
Total	29,116,453	34,600,000
1923		
January	3,251,694	3,860,000
February	2,919,017	3,460,000
March	3,402,007	4,040,000
April	3,321,278	3,950,000
May	3,537,753	4,200,000



Brownhoist 3 pulley idler with one-piece, perfect aligning brackets and Timken Roller Bearings.

Why You Can Depend on Brownhoist Conveyors

Brownhoist Products

Heavy Dock Machinery
Locomotive Cranes
Monorail Trolleys
Concrete Bunkers
Chain Conveyors
Belt Conveyors
Coal Crushers
Bridge Cranes
Buckets, etc.

Literature on request

Good belt conveyors materially reduce handling costs. This fact is generally recognized. Choosing a conveyor is therefore a question of buying the most efficient equipment rather than a consideration of economy alone.

Behind each Brownhoist Belt Conveyor is the wide experience of the Brownhoist staff of conveying engineers. Their skill and knowledge assure installation of properly designed units and the particular layout best adapted to the individual need.

The advice of Brownhoist engineers is available to any plant contemplating the installation of material handling equipment. Further information and data on request.

The Brown Hoisting Machinery Co., *Cleveland, O.*

Branch Offices: New York, Chicago, Pittsburgh, San Francisco, New Orleans

BROWNHOIST

MATERIAL HANDLING EQUIPMENT

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	17.50 to 18.00
Boston (dealers)	14.00 to 14.50
Buffalo	20.00 to 20.50
Chicago	17.50 to 18.00
Cleveland	19.00 to 19.50
Cincinnati	17.00 to 17.50
Detroit (dealers)	17.50 to 18.00
Eastern Pennsylvania	18.00 to 19.00
New York (dealers)	14.50 to 15.00
Pittsburgh	20.50 to 21.00
St. Louis	17.00 to 17.50
Valleys (nominal)	22.00
No. 1 railroad steel New York (dealers)	15.00 to 15.50

BUNDLED SHEETS

Buffalo	$16.25 to 16.75
Cleveland	12.75 to 13.00
Cincinnati	13.50 to 14.00
Detroit	15.50 to 16.00
Eastern Pennsylvania	16.50 to 17.00
Pittsburgh	18.00 to 18.50
St. Louis	13.00 to 13.50
Valleys	17.00 to 17.50

STEEL RAILS, SHORT

Birmingham	17.50 to 18.00
Boston (dealers)	14.50 to 15.00
Chicago	20.00 to 20.50
Cincinnati	23.00 to 23.50
Cleveland	17.50 to 17.75
St. Louis	19.50 to 20.00

STOVE PLATE

Birmingham	17.50 to 18.00
Boston	17.50 to 18.00
Buffalo	20.00 to 21.00
Chicago	17.50 to 18.00
Cincinnati (net tons)	12.50 to 13.00
Cleveland	17.00 to 17.50
Detroit (net ton) (dealers)	15.00 to 16.00
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	13.50 to 14.00
Pittsburgh	17.00 to 17.50
St. Louis	16.50 to 17.00

LOW PHOSPHORUS

Buffalo	26.00 to 27.00
Cincinnati	18.00 to 19.00
Eastern Pennsylvania	25.00 to 26.00
Pitts. billets and bloom crops	25.00 to 25.50

SHOVELING STEEL

Chicago	17.25 to 17.75
Pittsburgh	18.00 to 18.50
St. Louis	17.00 to 17.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	23.00 to 23.50
Eastern Pennsylvania	24.00 to 25.00
Pittsburgh	23.50 to 24.00
St. Louis	23.50 to 24.00

COMPRESSED SHEETS

Buffalo	19.50 to 20.50
Chicago	16.50 to 17.00
Pittsburgh	19.50 to 20.00
Cleveland	17.75 to 18.25
Detroit (dealers)	17.00 to 17.50
Valleys (nominal)	20.50 to 21.00

FROGS, SWITCHES, GUARDS

Chicago	17.50 to 18.00
Eastern Pennsylvania	18.00 to 19.00
St. Louis	17.50 to 18.00

BOILER PLATE, CUT

St. Louis	12.50 to 13.00

ANGLE BARS—STEEL

Chicago	18.50 to 19.00
St. Louis	18.00 to 18.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	18.00 to 19.00
Boston (dealers)	17.00 to 18.00
Buffalo	20.00 to 21.00
Chicago, No. 1	16.75 to 17.25
Chicago, No. 2	17.50 to 18.00
Cincinnati No. 1	15.00 to 16.00
Eastern Pennsylvania, No. 1	23.00 to 24.00
Pittsburgh, No. 1	21.00 to 21.50
Pittsburgh No. 2	20.50 to 21.00
New York, No. 1 (dealers)	19.00 to 20.00
St. Louis, No. 1	17.50 to 18.00
St. Louis, No. 2	17.50 to 18.00

WROUGHT PIPE

Boston (dealers)	10.50 to 11.00
Buffalo	17.00 to 18.00
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	11.50 to 12.00

YARD WROUGHT

Boston	15.00 to 16.00
Eastern Pennsylvania	19.00 to 20.00

CITY WROUGHT

New York, long	$16.50 to 17.00

BUSHELING

Buffalo, No. 1	19.00 to 20.00
Chicago, No. 1	16.25 to 16.75
Chicago, No. 2	12.50 to 13.00
Cincinnati No. 1	14.50 to 15.00
Cleveland, No. 1	16.25 to 16.50
Cleveland, No. 2	14.00 to 14.50
Detroit, No. 1	14.00 to 15.00
Detroit, No. 2 (new)	13.00 to 13.50
Detroit, No. 2 (old)	13.00 to 14.00
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh, No. 1	16.50 to 17.00
St. Louis No. 1	18.00 to 18.50

MACHINE SHOP TURNINGS

Birmingham	12.00 to 13.50
Boston (dealers)	12.00 to 12.50
Buffalo	17.50 to 18.00
Chicago	12.50 to 13.00
Cleveland	16.50 to 16.75
Cincinnati (net ton)	12.00 to 12.50
Detroit (dealers)	12.00 to 12.50
Eastern Pennsylvania	16.50 to 17.50
New York (dealers)	14.00 to 14.50
Pittsburgh	17.00 to 17.50
St. Louis	12.00 to 12.50
Valleys	17.00 to 17.50

CAST IRON BORINGS

Birmingham (chemical)	17.50 to 18.00
Birmingham borings (plain)	12.00 to 13.00
Boston (chemical)	14.50 to 15.00
Boston (dealers)	13.50 to 14.00
Buffalo	19.00 to 20.00
Chicago	14.25 to 14.75
Cincinnati (net tons)	13.00 to 13.50
Cleveland	16.75 to 17.00
Detroit (dealers)	13.00 to 13.50
Eastern Pennsylvania	17.50 to 18.00
Eastern Pennsylvania (chem.)	20.00 to 21.00
Pittsburgh	18.00 to 18.50
New York (dealers' price)	14.00 to 14.50
St. Louis	13.50 to 14.00
Valleys	18.50 to 18.75

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	12.50 to 13.00
Cleveland	16.75 to 17.00
Detroit (dealers)	12.50 to 13.00
Eastern Pennsylvania	16.50 to 17.50
New York (dealers)	13.50 to 14.00

IRON AXLES

Birmingham	27.50 to 29.00
Boston (consumers)	31.00 to 32.00
Buffalo	30.00 to 31.00
Chicago	31.00 to 31.50
Cincinnati	27.00 to 28.00
Eastern Pennsylvania	nominal
New York (dealers)	29.00 to 30.00
St. Louis	27.00 to 27.50

IRON RAILS

Buffalo	$23.00 to 23.50
Chicago	21.50 to 22.00
Cincinnati	16.00 to 16.50
St. Louis	18.00 to 18.50

PIPES AND FLUES

Chicago	13.00 to 13.50
Cincinnati	12.50 to 13.00
Cleveland	12.50 to 13.00
St. Louis	13.50 to 14.00

RAILROAD GRATE BARS

Buffalo	18.00 to 19.00
Chicago	16.25 to 16.75
Cleveland	17.00 to 17.50
Eastern Pennsylvania	18.00 to 19.00
New York (dealers)	13.50 to 14.00
St. Louis	17.00 to 17.50

FORGE FLASHINGS

Boston (dealers)	13.00 to 13.50
Chicago, small	13.00 to 13.50
Cleveland, small	17.00 to 17.50
Cleveland, large	17.00 to 17.50
Detroit (dealers)	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	12.75 to 13.00
Chicago	17.50 to 18.00
Eastern Pennsylvania	17.00 to 18.00

ARCH BARS AND TRANSOMS

Chicago	25.50 to 26.00
St. Louis	25.00 to 25.50

ANGLE BARS—IRON

Chicago	25.25 to 25.75
St. Louis	25.00 to 25.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	14.50 to 15.00
Buffalo	22.50 to 23.00
Chicago	16.00 to 16.50
Cleveland	17.25 to 17.50
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	18.50 to 19.00
St. Louis	14.50 to 15.00

STEEL CAR AXLES

Birmingham	24.00 to 25.00
Boston (consumers)	24.00 to 25.00
Buffalo	24.00 to 25.00
Chicago	23.50 to 24.00
Cleveland	26.00 to 27.00
Eastern Pennsylvania	nominal
New York (dealers)	nominal
Pittsburgh	24.00 to 24.50
St. Louis	22.00 to 22.50

SHAFTING

Boston (consumers)	23.00 to 23.50
Chicago, iron	21.50 to 22.00
Eastern Pennsylvania	24.00 to 26.00
New York (dealers)	21.50 to 22.00
St. Louis	24.00 to 24.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	22.00 to 23.00
Birmingham, iron	21.00 to 22.00
Boston (consumers)	23.50 to 24.00
Buffalo, iron	21.00 to 22.00
Chicago, cupola	22.50 to 23.00
Cincinnati	17.50 to 18.00
Eastern Pennsylvania	22.00 to 24.00
New York iron (dealers)	18.00 to 19.00
Pittsburgh, iron	22.00 to 22.50
Pittsburgh, steel	23.50 to 24.00
St. Louis, iron	21.00 to 21.50

NO. 1 CAST SCRAP

Birmingham, cupola	23.00 to 24.00
Boston (consumers)	24.75 to 25.25
Buffalo	23.00 to 24.00
Chicago, railroad	24.00 to 24.50
Cincinnati, No. 1 machinery, cupola (net tons)	22.50 to 23.00
Cleveland, cupola	23.50 to 24.00
Detroit (net ton) (dealers)	18.00 to 19.00
Eastern Pennsylvania, cupola	22.00 to 23.00
New York, cupola (dealers)	19.00 to 20.00
Pittsburgh, cupola	24.00 to 24.50
San Francisco	26.00 to 28.00
St. Louis, railroad	20.50 to 21.00
St. Louis, agricultural	20.50 to 21.00
Valleys	24.00 to 25.00

HEAVY CAST

Boston (consumers)	21.00 to 22.00
Buffalo	18.00 to 19.00
Cleveland	19.00 to 19.50
Detroit (automobile) (net ton)	23.00 to 23.50
Eastern Pennsylvania	19.00 to 19.50
New York (dealers)	18.00 to 19.00
Pittsburgh	19.50 to 20.00

MALLEABLE

Boston (railroad) (consumers)	24.00 to 25.00
Buffalo	24.00 to 25.00
Chicago, railroad	24.00 to 24.50
Chicago, agricultural	22.50 to 23.00
Cincinnati, agricultural	18.50 to 19.50
Cincinnati, railroad	20.00 to 20.50
Cleveland, agricultural	24.00 to 25.00
Cleveland, railroad, nominal	25.00 to 25.50
Detroit (dealers)	22.00 to 23.00
Eastern Pennsylvania, railroad	22.00 to 23.00
Pittsburgh, railroad	24.00 to 24.50
St. Louis, agricultural	19.50 to 20.00
St. Louis, railroad	20.00 to 21.00

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	20.00 to 21.00
Boston (dealers)	16.50 to 17.00
Chicago	19.50 to 20.00
Cleveland	21.50 to 22.00
Detroit	16.00 to 16.50
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	20.00 to 20.50
Pittsburgh district	21.50 to 22.00
St. Louis	18.50 to 19.00

LOCOMOTIVE TIRES

Chicago	19.50 to 20.00
St. Louis	18.00 to 18.50

LOW PHOSPHORUS PUNCHINGS

Chicago	20.50 to 21.00
Eastern Pennsylvania	26.00 to 28.00
Pittsburgh	24.50 to 25.00

LOGEMANN

Double Ram Hydraulic
Scrap-Metal Presses

STANDARD
In Hundreds of Mills, Yards and Plants

Hydraulic-compressed scrap always commands the best prices. It is more conveniently stored—more economically handled—there is less loss from corrosion—less heat is required for remelting.

Loose Scrap is worth almost nothing.
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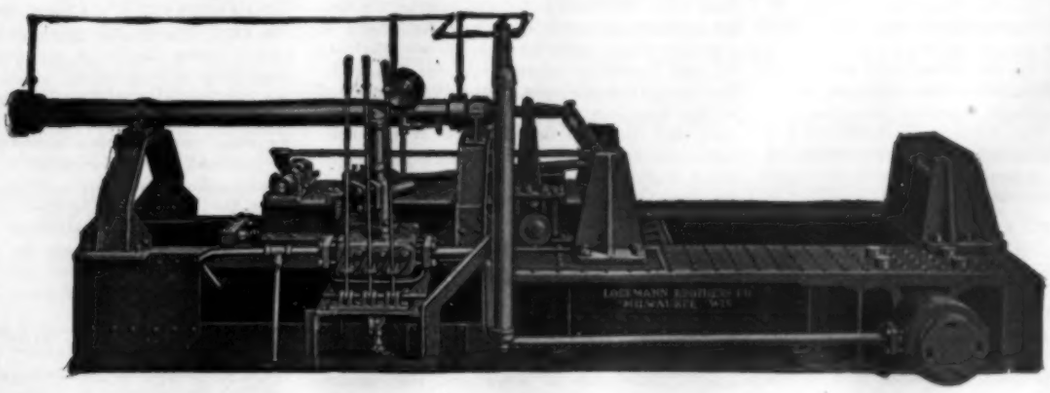
LOGEMANN BROTHERS CO., 3126 Burleigh St. MILWAUKEE, WIS.



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Business in Canada

KIRKLAND LAKE, ONT.—This city plans to install a waterworks system at an estimated cost of $150,000.

NIAGARA FALLS, ONT.—The Canadian Power Co., is building an outdoor Transformer station to cost $150,000 and have 60,000 horsepower capacity.

NIAGARA FALLS, ONT.—Extensive additions are being made and new equipment installed in the plant of the United States Light & Heat Co., recently established here.

OAKVILLE, ONT.—The plant of the Oakville Wire Bound Box & Basket Co. Ltd., was damaged by fire on May 27th with a loss of $225,000.

ORILLIA, ONT.—The Sheet Metal Tool & Hardware Co., has completed the purchase of the bathroom fixture business of the Kinsinger Bruce Co., of Niagara Falls, Ont., and will remove all machinery, dies, tools, patterns and fixtures to the Orillia plant.

PORT HOPE, ONT.—The Port Hope Sanitary Mfg. Co., has awarded contract to B. Pennington & Son, for the erection of a smelter building.

STRATFORD, ONT.—The Dodds Machinery Co., Welland, Ont., proposes to remove its plant to Stratford. The company expected to receive concessions from the City of Welland, but owing to refusal on part of officials, has decided to seek a new location for its plant.

THORNBURY, ONT.—This city plans the erection of a waterworks system.

TORONTO, ONT.—The Toronto Transportation commission, has awarded contract to Sullivan & Fried for the erection of carhouse at Roncesvalles avenue and Queen street, to cost $300,000.

TORONTO, ONT.—G. A. Prior, Ltd., has been incorporated to manufacture lubricating systems, automobiles, motors, engines, machines etc. ,with $30,000 capital stock, provisional directiors, Harry C. Moore, George A. Prior and George T. Stephenson of Toronto.

MONTREAL, QUE.—The construction of a new cement plant by the National Cement Co. has been started.

New Trade Publications

BUILDING CONSTRUCTION—An 8-page booklet recently has been published by the Dwight P. Robinson & Co. picturing some of the construction work completed recently by this company. Illustration of apartment houses, hotels, office buildings and similar structures, as well as of power and industrial projects now being carried out in various parts of the United States are shown.

GAS COMBUSTION SYSTEMS.—A booklet has been published illustrating by means of photographs and drawings the application of one-valve control gas combustion systems to the steel industry, showing in particular the application to sheet, annealing and heating furnaces. This combustion system is manufactured by the Selas Co., Philadelphia, with the American Heat Economy Bureau, Pittsburgh, as the sole agents for the United States.

OIL BURNERS.—The Anthony Co., Long Island City, N. Y., is circulating a 4-page illustrated folder showing the design, application and operation of an oil burner. The burner is of small capacity for low temperature ovens, and is adapted for duplicating heat conditions where gas through perforated pipes has been the only practical fuel. The device is applicable to any fuel oil and is designed for heat distribution in drying, baking japanning and other processes requiring low temperatures.

BAND SAWS.—A pamphlet published recently by the Oliver Machinery Co., Grand Rapids, Mich., illustrates and describes a new type of band saw introduced by this company. The saw accommodates 36 inches between the blade and column and will take 16 inches under the guide. The table tilts 45 degrees to the right and 5 degrees to the left. Blades from 17 feet 5 inches to 19 feet 3 inches long and from ⅛ to 2½ inches wide can be used. Various attachments for the machine are also described.

BLOWERS.—The Connersville Blower Co., Connersville, Ind., has published a 32-page illustrated booklet describing various types of blowers, gas exhausters, rotary pumps and vacuum pumps manufactured by this company. Furnishing air for the foundry cupola is one of the chief uses of this rotary blower. According to the booklet the use of the positive rotary assures a constant volume of air entering the cupola regardless of the resistance furnished by the charge. This type of blower is run at a relatively slow speed. Gas exhausters, as described, are used for artificial gas plants and high pressure gas pumps, the rotary cycloidal pumps for mining, drainage, water works and circulating purposes and the cycloidal vacuum pumps for combined air and water pumps for jet or surface condensers or at any service where vacuums are required.

HOT WATER HEATERS—The Patterson-Kelley Co., 101 Park avenue, New York, has published a 32-page illustrated booklet describing various types of hot water heaters. The heaters are constructed of heavy boiler plate with the longitudinal seams either double or triple riveted. The tubes are seamless drawn copper, tested to a hydrostatic pressure of 1000 pounds per square inch. In addition to the descriptions, the book contains tables showing the rated heating capacities in gallons per hour to different temperatures using various pressures.

RUST PREVENTION.—The Eagle-Picher Lead Co., 208 South LaSalle street, Chicago, has issued a pamphlet describing the results of a test made to determine the paints affording the best protection against rust to steel ships. The results of the test, which was conducted by the American Society for Testing Materials, show that the paint manufactured by this company was in the best condition of all paints tested at the end of six years. It is stated in the pamphlet that approximately $1,609,500 is lost annually in the United States due to the rusting of metals.

OIL BURNERS.—A 32-page booklet describing various types and installations of oil burners have been published by the Combustion Engineering Corp., New York. The subject of fuel oil is carefully discussed, including the supply, advantages in using, and the preparation of specifications for using oil as fuel. The types of burners installed by this company are described. Instructions are given relative to the types of furnaces required or best adapted to the use of oil burners. The last article is a comprehensive treatise on the combustion of fuel oil. The booklet is well illustrated.

STEAM ASH CONVEYORS.—The various points of design of steam ash conveyors are carefully described in a pamphlet publised by the Conveyors Corp. of America, Chicago, According to specifications listed in the pamphlet the conveyor consists of a line of hard metal pipe of 6, 8, or 9-inch diameter laid in a trench in the boiler room floor or in an ash tunnel. Intakes for the introduction of ashes are located before the pit. A jet of high velocity steam introduced into the conveyor system just beyond the last ash intake furnishes the motive power. The pamphlet is well illustrated, showing parts of various installations.

GAS AND OIL BURNERS.—Oil and gas burning systems are described in a pamphlet issued by the North American Mfg. Co., Cleveland. The principle applied in the design of these burners is the use of a special low-powered blower for the fire. When burning, this burner mechanically mixes the gas and air in correct proportions in the fan case before discharging into the nozzle which may be used singly or in multiple as the case may require. In burning oil at low pressure the oil burner is attached to the blower discharge. Illustrations of burners, blowers, torches and oil strainers are also included in the pamphlet.

COMBINATION LATHE, MILLER AND DRILL.—The Triplex Machine Tool Corp., 50 Church street, New York, has published a folder illustrating and describing a machine for turning, milling and drilling. This machine is adapted to shops having a limited floor space. By using milling cutters mounted on an arbor the machine can be connected into a horizontal bench milling machine. As a sensitive drill press the spindle can be used for vertical, angular or horizontal operations. Internal and external thread cutting can be done by using a master screw or required pitch. The specifications of the combined machine are also given.

STEEL SHELVING.—An 8-page folder published recently by the Levene Steel Products Corp., Elizabeth, N. J., shows the construction and lists the advantages of shelving constructed entirely of steel. The type of steel shelving described is built on the book case principle. Each shelf can be put together without the aid of tools, making it possible to set up the shelf at the time the material is placed. Each shelf is independently adjustable. The booklet also contains pictures of installations in stockrooms of various types and information on the proper method of planning a stockroom, making possible the maximum amount of light and at the same time sacrifices the minimum amount of space. Other products manufactured by this company, namely a unit bin box, adjustable and convertible truck platform and steel office partitions are illustrated and described.